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TABLE OF CONTENTS

The Professional Education of the Teacher in Service 155
Robert H. Rodgers
Auto Mechanics in the Junior High School 157
S. D. Horning
Machine Construction in a Technical High School 159
J. D. Littlefield
Information Test for the Woodworking Department 163
Paul N. Wenger
Industrial-Arts Contests and Exhibits 167
S. M. Dell
How is Your Dome? 173
Laurence Parker
The Hidden Values of the Trade Analysis 173
J. Douglas Wilson

EDITORIALS: Getting the Requisitions in Early—Revising the Shop Layout—The Classroom Budget—Standardization—The Professional Magazines 174
Vocational Guidance at Providence, Rhode Island 176
Arthur J. Peel
A Few Do's for the Manual-Training Teacher 177
C. M. Gilmore

SUPPLEMENTS

Machinists' Tool Chest ..... No. 92
Jos. J. Lukowitz
Automobile Trailer ..... No. 93
M. C. Koenders

PROBLEMS AND PROJECTS

The Senior Class Gift 178
Leon H. Baxter
Utility Test Board 180
Victor Rimsha
Foundry Work in the High School 180
Claus S. Asp
Printshop Work Cabinet 181
Chester A. Lyle
Wrought-Iron End Table 182
Royal F. Jennings
Art and Manual-Training Lamp Standards and Shades 183
C. Anthony Van Kammen
Machinists' Tool Chest 184
Jos. J. Lukowitz
A Light, Efficient Tourist Trailer 184
M. C. Koenders
Spinet Desk 185
Ray Treasure
Checking List for Mechanical-Drawing Tests 187
August Flam
A Sheet-Metal Megaphone 187
J. W. Bollinger

Principles of Vocational Guidance Adopted by the National Vocational Guidance Association 187
Will Standardize Lettering on Drawings ... 188
"Now, Ask Me One" 189
New Books 189
Association and Convention Activities 190
Now, Are There Any Questions? 192
Personal News Notes 36a
News and Notes 36a
School Shop Equipment News 52a

THE WESTERN-ARTS CONVENTION

The Western-Arts Association will hold its thirty-fourth annual convention May 2nd to 5th, 1928, at Indianapolis, Ind.

A perusal of the program shown on page 191 of this issue, shows that nonattendance at this convention means a real loss to anyone interested in the activities of this association.

Remember the convention dates.

(The articles contained in the Magazine are regularly indexed in "The Reader's Guide to Periodical Literature.")

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STAR LATHES

THE INDUSTRIAL ARTS MAGAZINE

Volume XVII MAY, 1928 No. 5

THE PROFESSIONAL EDUCATION OF THE TEACHER IN SERVICE

Robert H. Rodgers, Milwaukee Vocational School, Milwaukee, Wis.

THE PROBLEM of the professional education of teachers in service has many ramifications. It is the intention in this discussion to hold specifically to those problems that are most pertinent to the situation as found in the part-time vocational school. Certain parts of the discussion may have suggestions that will be of value in developing training-in-service programs for any type of vocational school.

Three major aspects of the problem present themselves, namely, (1) the teaching situation in a part-time vocational school; (2) teachers and their preparation; (3) a plan of professional education in service that will improve the work of the teachers. Each aspect of the subject will be taken up and discussed in some little detail.

The Teaching Problem in a Part-Time Vocational School

The part-time vocational school as it is operating in the different states affords an opportunity for young people between the ages of 14 and 18 or 16 and 18 who have not completed the high school to return to school for varying periods of time ranging from four hours each week to even half time in certain instances. The individuals that return have completed different grades in the full-time school; many different types and kinds of ambitions are represented in the groups; places of present employment are as widespread as the industries and business of the community. Individual differences with accompanying needs exist throughout the student body of the part-time school. Individual diagnosis and individual educational treatment make the teaching problem a complex one and different in many respects from the traditional full-time school situation. The short-time contact of a day or a part of a day each week, and the range of individual differences require a different approach and a different organization of the instructional content.

Teachers and Their Preparation

It is apparent that the teaching problem has many elements that are more or less distinctive of the part-time vocational school. The source of teachers has been the established teacher-training institutions, the ranks of the teachers found in the full-time school, the skilled trades, and the stores and offices. What is it that can be expected of these people coming into an educational situation that is recognized as being unusually complex? Can it be expected that they are going to come "ready-made," wholly familiar with the objectives of particular institutions, adjusted to the problems of preparing their instructional materials and teaching individual students? A particular school cannot say to a teacher-training institution, "these are the specifications for our teachers; prepare them accordingly." Teacher-training institutions have a very definite responsibility for equipping prospective vocational teachers with the supplementary technical aspects of their vocations, general objectives and organization of the vocational education movement, the general methods of analyzing, organizing, and teaching vocational subject matter, and an understanding of individual professional responsibility. Teachers equipped with this general preparation may be very readily adjusted to the demands of a particular school or school system.

Teachers coming directly from vocational fields assuming the responsibility for classroom instruction are not necessarily prepared to do the most effective work. Likewise, it is partially true that teachers coming from another school or system need adjustment to the new organization with its different objectives and its details of operation.

This discussion leads to several conclusions, namely, (1) that schools or school systems are different in their organization, their operation, and in the details of their objectives; (2) that established teacher-training institutions cannot be expected to prepare specifically for the work of a particular school or system; (3) that teachers are not "ready-made" and whatever their source they must be prepared and adjusted to the requirements of each school or system; (4) therefore, the local school system through its supervisory force has the responsibility to develop and conduct courses or programs of work for the professional education of its teachers in service.

A Plan for the Professional Education of Teachers in Service

Recognition of the validity of the conclusions of the preceding section leads to the necessity for developing a plan to provide the professional work that evidently is required. It is the purpose to present not only a plan but also certain conclusions that have been reached in carrying out a program at the Milwaukee Vocational School for the past four years.

Dr. R. L. Cooley, director of vocational education for the city of Milwaukee recognized very early in the development of the institution that a very definite portion of the teacher-training problem for the part-time vocational school was one of preparation in service. Realization of this need led to the organization of a division of teacher training and research as an integral part of the institution. The specific functions of this division were narrowed to the definite problems of (1) the professional education of the teaching staff which numbered approximately two hundred men and women; (2) to conduct such research studies that would serve to constantly meet the problem of a rapidly developing program. This assignment of responsibility left the division entirely free from the many operating details that would tend to subvert its activities and defeat the accomplishment of its objectives.

The first step that was taken in the organization of this program was a study of the organization of the school, the teaching problems and the qualifications of the teachers. This study disclosed in detail that the instructors would profit from

certain very definite teacher-training courses and from a plan of supervision that was essentially an integral part of the courses. This disclosure led to the organization of a program that included the following:

1. A plan of certification of teachers that is essentially a part of the teacher-training development;
2. A plan of formal training for all teachers with less than five years of teaching experience in the institution;
3. A plan of informal training operating through supervision and individual conferences.

The plan of certification provides for a limited vocational teacher's certificate which is granted at the time of entrance to the service and is valid for a period of three years during which time the formal teacher-training requirements must be removed. The second type of credential is called the permanent vocational teacher's certificate and must be earned during the first three years of service by the completion of 210 hours of formal professional work. The rating of an individual teacher is determined to a large degree by the quality of professional work accomplished in working out the requirements for the permanent certificate.

The professional education of the teachers in service does not terminate with the securing of the permanent certificate. The more formal part is completed but each individual teacher will be advised to do certain types of additional work as needs are evident. Some will be advised to take certain summer courses in a teacher-training institution, others will be directed in industry for a period of two months, etc.

The second part of the program is the formal professional courses that are taken by all teachers entering the service. The initial survey of the entire problem revealed that teachers needed assistance in the following: (1) organization of the teaching content of their own subject; (2) special teaching problems where individual instruction is a very important factor; (3) better understanding of the objectives and organization of the institution; (4) acquiring a practical technic of counseling with individual students and a knowledge of the vocations of the community. The disclosure of the needs led to the organization of four specific courses. The titles, objectives, and length of each course are herewith presented.

Vocational Education I. Analysis and Organization of Instruction for Vocational Classes.

Length of Course, 90 Clock Hours.

Objectives of the Course

1. To have the teacher thoroughly understand and appreciate the principles of analysis and organization as it applies to the preparation of instructional material.
2. To have the teacher prepare the instructional material of his specific subject or subjects for immediate use with students in a vocational school, employing in the preparation the accepted principles of analysis and organization.

Vocational Education II. Teaching Problems in a Part-Time Vocational School.

Length of Course, 60 Clock Hours.

Objectives of the Course

1. To have the teacher understand and appreciate the special psychological characteristics and tendencies of the young working boy and girl and to understand the basic principles of human behavior that must be observed in the teaching-learning process.
2. To equip the teacher to meet effectively the classroom problems of individual diagnosis and teaching and management that prevail in the part-time vocational-school class.

Vocational Education III. The Objectives and Organization of the Part-Time Vocational School.

Length of Course, 30 Clock Hours.

Objectives of the Course

1. To have the teacher acquire the fundamental social, economic and educational facts that pertain to the working youth of Milwaukee.
2. To have the teacher know and appreciate the relation of the above facts to the development of public part-time vocational education.
3. To have the teacher know and appreciate the specific objectives and the organization of the Milwaukee Vocational School.

Vocational Education IV. Vocational Guidance and a Study of the Occupations of the City of Milwaukee.

Length of Course, 30 Clock Hours.

Objectives of the Course

1. To have the teacher know and appreciate the importance and possibilities of vocational and educational guidance in a vocational school.
2. To have the teacher know the methods and procedure essentional to the effective guidance and counseling of students in a vocational school.
3. To have the teacher know the occupational facts concerning the city in which he is teaching and to appreciate the value of these facts in counseling and advising with individual students.

The formal work in the above four courses is offered at very definite times, namely, after school hours on Monday and Wednesday of each week, on Saturday mornings and also during the month of August. It is optional with teachers when the work is to be taken except that at least one course must be satisfactorily completed each year. The formal classwork is organized in the form of very definite units with provision for class discussion and assignments to be developed outside of the time devoted to the formal work. In addition to the above time teachers report once or twice each week on a schedule during vacant periods of the school day to seminar leaders, who are the supervisors, for work especially on the curriculum. The revision of the curriclum is a process that is going on constantly.

The informal phase of the professional education of teachers in service centers about (1) a plan of supervision; (2) personal conferences. Developing the plan of training in service through supervision requires that the supervisory force be especially prepared to carry out the program. All the supervisors completed the formal courses and by means of group conferences with members of the staff of the division of vocational teacher training and research were prepared to carry on the informal aspects of the program.

The general endeavors of the supervisory force as they affect individual teachers are as follows:

1. To have the instructional work so thoroughly organized that a teacher can set a class, a group, or an individual pupil at profitable work without loss of time as soon as such pupils present themselves for instruction in any classroom.
2. To have every required piece of physical equipment in good condition, in its proper place, and ready for use so no pupil will be in a position to say, "I have nothing with which to work."
3. To have each classroom a model of cleanliness, order, and good appearance, and a credit to the institution.
4. To have a staff of instructors thoroughly familiar with all the problems involved in teaching in a vocational school classroom.
5. To have a staff of teachers thoroughly acquainted with the occupation and many of the personal needs of every student assigned to them and able to judge and advise them properly.
6. To have all classrooms placed where a proper work spirit exists and where a pleasant relationship between teachers and pupils is uniformly present.
7. To have every teacher in the institution (*a*) thoroughly informed concerning the institution and his individual responsibilities; (*b*) conducting a highly efficient classroom; (*c*) happy and contented in serving the young man and woman that comes to the school.

The specific details of the plan of supervision cover the following:

1. Condition of the classroom.
2. Condition of equipment.
3. Condition of supplies and stock.
4. Condition of records.
5. Condition of notebooks and instructional material.
6. Effectiveness of class management.
7. Effectiveness of instruction.
8. Attitude of students.
9. The teacher at work.

Each one of the major responsibilities indicated above has been subdivided and the entire plan issued in bulletin form

so that teachers will be acquainted with every detail. Every phase of the plan is essentially a part of the more formal work carried on in the four courses previously described.

Much informal work of a teacher-training nature is also carried on through individual conferences. Teachers recognize the teacher-training and research division as a service agency and are constantly turning to it for assistance and guidance. Naturally this assistance to teachers takes a variety of forms covering classroom problems, viewpoints, attitudes, relationships, etc.

The entire plan for the professional education of teachers in service in the Milwaukee Vocational School is an organized, continuing part of the institution's program. The various aspects of the program were developed as a result of a study of the needs of the teaching corps. The responsibility for the planning and the development of the undertaking was specifically delegated to the division organized for that purpose. It was the recognition of the above elements in the problem that aided very materially in carrying out the many details of the program.

Some Conclusions

The experience gained over a period of four years in conducting this program has led to certain conclusions that may be summarized as follows:

1. Teachers do not come "ready-made" to a particular institution from any source.
2. Teacher-training institutions cannot be expected to prepare teachers for the specific duties or responsibilities of a given school or system. Their function is to provide the basic preparation that will enable them to enter upon the work in any situation.
3. Teachers therefore need to be developed or adjusted in terms of the particular objectives and organization of the school system or institution into which they are going.
4. Local institutions or school systems therefore have the responsibility of adjusting their teachers and stimulating professional interest and growth.
5. The nature of the training-in-service program should be determined only after a careful analysis of the needs of individual teachers.
6. The responsibility of training should be definitely delegated to a certain agency or organization within the school or system and a planned program carried on consistently throughout the year.
7. The training should be a definite part of the activities of the school or system and the quality of work done by individual teachers should be an important factor in determining their status.
8. Teacher training in service is not a burden upon the teachers if it has values which they appreciate. Under these conditions it serves to stimulate and build efficiency and professional morale.

AUTO MECHANICS IN THE JUNIOR HIGH SCHOOL

S. D. Horning, John Marshall Jr. High School, Pasadena, California

AUTOMOBILE INSTRUCTORS, do you know what the rest of the world is doing in your field? What subject is more practical and yet what course is less standardized?

In order to determine the present status of auto mechanics in the junior high schools of the United States a questionary was sent to the supervisors of industrial arts in the junior high schools of 180 of the larger cities of the United States. It called for the following items:

1. The number of junior high schools offering automobile work.
2. The specific objectives of the auto-mechanics course.
3. The size of classes.
4. The duration of the course.
5. The method of presenting the work.
6. The exact tile of the course.
7. The name of text and references.
8. The outline of the course.
9. The advisability of auto mechanics as a prescribed course.

Returns were received from 119 of the leading city systems distributed throughout the United States. The large percentage of replies, (66) and the personal interest shown in the problem indicate that many consider auto mechanics to have a decided value as a junior-high-school subject.

The Place of Auto Mechanics in the Junior High School

Of the cities reporting, 66, or 55 per cent, have from 1 to 19 junior high schools. These city systems have a total of 277 junior high schools or an average of 4 per city. Of these systems, 34, or 75 per cent, include automobile work in their curriculum. This is an average of a little less than 2 per system, i.e., one fourth of all the junior high schools offer automobile courses.

Thirteen systems, or 12 per cent, intend to offer automobile courses or to extend those already existing.

In addition to the above systems, 30 which do not offer auto mechanics in the junior high school, do offer it in other schools of the system such as the senior high school or vocational schools.

Although the tendency is for more systems to offer automobile courses, or to increase the number of already existing classes within the system, 3 cities with a total of 6 junior high schools have found the course impractical and will discontinue automobile work in these schools in the future. The reasons given are:

1. Subject is too advanced for 7th and 8th grade pupils.
2. Age of pupils forbids operating shops with privately owned cars.
3. Work done on material purchased at junk yards is of doubtful value because of its age and abstract nature.
4. As such work cannot be given to 7th and 8th grade pupils with any degree of efficiency, the shop must depend on the 9th grade only for enrollment. The work is elective, hence the auto shop cannot be filled with students.

When we consider that the junior-high-school movement was in its infancy in 1912 the fact that 34 of the 66 systems reporting, or 52 per cent of them, offer automobile work and that over 27 per cent of all the junior high schools offer the subject, it is shown how important is the place of auto mechanics in the curriculum. When we note that 12 per cent are planning to install or extend such courses this year and that less than 1 per cent of the schools have found it impractical, we may well consider the course in auto mechanics as having permanent value in the junior-high-school curriculum.

Specific Aims of the Course in Auto Mechanics

In order to establish a course of study, it is not only necessary to determine the general objectives of the school and of the department but also of the specific subject. If these objectives do not contribute to the general school and departmental objectives the subject should have no place in the curriculum. The specific aims as determined in this study

of the judgments of the supervisors acquainted with auto-mechanics courses in the junior high school follow in their rank order:

1. General training
2. Exploratory
3. Utilizer's appreciation
4. Handyman
5. Correlation with other subjects
6. A skilled technic

A comparison of the rank order of the specific aims of the auto-mechanics courses with the industrial-arts objectives as stated by recent writers shows that:

1. Automotive courses contribute to the industrial-arts objectives for in general the objectives are the same.
2. Automotive courses are considered of great practical value as is shown by the fact that utilizer's appreciation received third rank.

Supervisors consider auto mechanics as a valuable junior-high-school subject, for it offers a broad general training, offers a wide field of exploration, and is of practical value.

The objective of handyman may be considered, but a skilled technic and correlation with other subjects receives but little emphasis in the junior high school.

Size of Classes

The data show that the classes of the present time range from 12 to 30 with 20 as a median. The average-size class in 1921 according to Stockwell was 12 as compared with 20 today. The ideal number desired is from 10 to 24 with 15 as a median. These observations indicate that auto mechanics is becoming more popular with the students; the size of classes is increasing rapidly; the supervisors feel this increase and express a desire for smaller classes.

Duration of the Course

The length of the course in weeks varies from 3, where the course is included in the general shop program, to 60 weeks where vocational training is the practice. Six systems offer from 9 to 10 weeks or one quarter; 5 offer from 36 to 40 weeks or one complete school year. The majority offer the course for one semester of 18 or 20 weeks.

The number of periods per week ranges from 2, in cases of some general-shop programs, to 15 for those shops which give vocational training. Eight systems offer 10 periods per week. These are the double periods of 45 minutes each. The majority offer 5 periods per week.

The length of period varies from 40 to 90 minutes. The period lengths are grouped into three groups, the 40 to 45-minute period, to 55 to 60-minute period, and the 85 to 90-minute period. This latter period may be considered as a double 40 to 45-minute period. There are as many schools offering 45-minute as full hour periods. The average is a 55-minute period.

The median indicates the duration of the course to be one semester of 18 to 20 weeks of 5 one-hour periods per week.

Method of Presentation

Considerable emphasis should be placed on the method of presentation for upon this depends the success or failure of the course. Industrial-arts methods have been criticized as being wasteful and inefficient. Auto mechanics offers large opportunities in methods of presentation as is shown below in rank order.

Method	Frequency
Individual instruction	30
Class instruction	30
Job sheets	30
Blackboard demonstration	26
Reference material	17
Project method	16
Moving pictures	14
Textbook in hands of the pupils	9

Individual instruction, class instruction, job sheets and blackboard demonstration are the most popular methods of presentation.

There seems to be very little use of the textbook in the hands of the pupils. Sixteen use the project method and fourteen include moving pictures as being desirable.

Shop Methods

Method	Frequency
Unit operation	26
Schools furnish cars	25
Take in cars for repair	21

A large majority, 25 of the 32 systems reporting, provide cars for the shop rather than depend entirely on taking in privately owned cars for repair. Six of the supervisors find the practice of repairing cars very unsatisfactory because the pupils are too young to be depended upon for responsible work. They feel that the time of the course is too short to develop sufficient mechanical skill in the boy. The educational value of many repair jobs is doubtful.

The unit-operation system is used at present by 26 of the 32 systems reporting. In this system the automobile is taken apart and the individual units are mounted separately. This method permits each unit to be studied and operated independently of every other unit. Cars are taken in for repair by 21 of the 32 systems reporting.

Courses

Title	Frequency
Auto Mechanics	23
Auto Repair	3
Metal and Auto Mechanics	3
Automobile Shopwork	2
General Shop	2
Auto Mechanics Trade	2
Gas Engine	2
Auto Construction and Machine Shop	1
General Metal Work	1

Auto Mechanics is the title in general use throughout the United States. There is also a tendency to offer automobile work in connection with other types of work as in the general shop and in shops given over entirely to metal work. One school offers an advanced course in automobile appreciation.

Texts and References

The value of the text in automotive courses may be questioned for only 6 of the 34 systems reporting are using any text in the hands of the pupil. Several systems use the reference library in the shop. A list of texts and reference material which was listed in the replies, follows:

Title and Author	Frequency
Auto Mechanics, Wright	3
The Automobile, Kuns	2
Automotive Repair for Home and School, Smith and Kern	2
American Technical Society	2
Dyke's Encyclopedia	2
Instruction sheets written by instructors	2
The Gasoline Automobile, Hobbs and Elliott	1
Fordsmen	1
Ford Manual	1
Magazines and manufacturing bulletins	1

Considerable effort is being made to find a suitable text and references which can be used in the junior high school. The above table would seem to show that there is no text which has been found suitable at the present time. The material available has been arranged in most cases for trade-training classes.

Outline of the Course

The list of subjects offered in the automotive courses and the percentage of frequencies show that in general the automobile courses cover the mechanics of the automobile rather thoroughly. This is to be expected and results probably from the fact that the subject of auto mechanics as given for trade purposes has been tranferred *in toto* to the junior high school. If the objectives of the junior high school are to be realized the subject matter must be of much wider scope and of a more elementary nature. It hardly seems possible that the objectives of the junior high school, such as utilizer's appreciation, industrial information, exploration, are being attained by the restricted subject matter of many of the courses as reported. The inclusion of such subjects as, "The History of the Auto-

mobile," "Comparative Automobile Values," "Driving and Traffic Regulations," indicates the wider scope of the automotive field of instruction and the greater practical value of the course to all individuals who take it.

Such subject matter will more nearly meet the needs of the pupil.

Outline of the Course

Subject	Frequency	Per Cent
Engine	32	100
Carburetor	32	100
Ignition	32	100
Clutch	32	100
Transmission	32	100
Rear-axle drive	32	100
Cooling systems	31	96
Starting and lighting	30	93
Storage batteries	27	84
Tire repair	26	81
Gas engine science	23	72
History of the automobile	21	65
Driving and traffic regulations	17	53
Comparative automobile values	15	47
Cost of upkeep and repair	13	40
Judging used cars	12	37
Touring	9	38

Many courses are reaching out into this wider field as is indicated above. For instance, in addition to the 100-per-cent usage of the subjects of engine, carburetor, ignition, clutch, transmission, rear-axle drive, front-axle drive, 84 per cent take up storage batteries, 81 per cent tire repair, 65 per cent the history of the automobile and 53 per cent driving and traffic regulations. All of these subjects are offered in more than half of the courses, which indicates that they have been found of considerable value. Judging used cars, cost of upkeep and repair, and touring seem to be considered of little value or are found too difficult or unsatisfactory for the junior-high-school pupil.

Should the Automotive Course Be Compulsory?

The universal use of the automobile has opened large and diversified fields which offer great opportunities. Every boy should have an opportunity to investigate these fields for himself in order to ascertain, as far as possible, his possibility for success in one of the many branches of the automotive field. Automobile statistics of the United States show that every seventh person owns an automobile. Therefore, a large per cent of the boys who graduate from the junior high schools will own and operate a car. They should be familiar with the operation, cost, and upkeep of an automobile and be acquainted with the driving and traffic regulations. This raises the question, should the study of an article so universally used as the automobile be a prescribed subject of the junior-high-school curriculum? Out of 51 supervisors distributed throughout the United States, 16 said that it should be, and 35 that it should not be made a prescribed course.

Although the majority think the course should not be compulsory, it is significant that so large a number should consider it of sufficient value, especially if given as a finding course, that it should be required of every high-school boy.

Summary of the Findings in the Questionary

1. Auto mechanics may be considered as having permanent value in the junior high school since over half of the systems having junior high schools offer auto mechanics. Twelve per cent of the systems will install or extend auto mechanics within the year. Less than 1 per cent of the schools have found the course impractical.
2. The principal objectives of auto mechanics are: First, general training; second, exploratory; third, utilizer's appreciation.
3. The average-size class is increasing in numbers. The present median is 20.
4. The median duration of the course in auto mechanics is one semester of from 18 to 20 weeks, having five 55-minute periods per week.
5. The most popular methods of instruction are: First, individual instruction; second, class instruction. Blackboard demonstration and job sheets are used by an equal number. The unit operation is coming into favor for shopwork.
6. Auto mechanics is the most popular title for the automobile courses.
7. The majority of the automobile courses are taught without a text.
8. The subject matter covers the mechanics of the automobile rather thoroughly. Over 50 per cent extend the course into the broader fields of the automotive industry.
9. One third of the supervisors favor auto mechanics as a prescribed course.

MACHINE CONSTRUCTION IN A TECHNICAL HIGH SCHOOL

J. D. Littlefield

East Technical High School, Cleveland, Ohio, has two well equipped machine shops. They are both equipped with modern machine tools. In addition to engine lathes, shapers, planers, drill presses, milling machines, and grinders, that are usually found in school shops, they also are fortunate in having such tools as turret lathes, and horizontal and vertical boring mills.

With this equipment the students are afforded ample opportunity for real practical machine-shop work of a constructive nature. The machines illustrated herewith, were constructed and built by the students. These finished projects are evidence of the thorough foundation underlying the shop training which is given to the students at this technical school.

In the general machine-shop practice, the students receive training in the practical use of the engine lathe for straight and taper turning, thread cutting and chucking work. They also are instructed in plain milling, gear cutting, planer and shaper work, cylinder and tool grinding. Besides learning

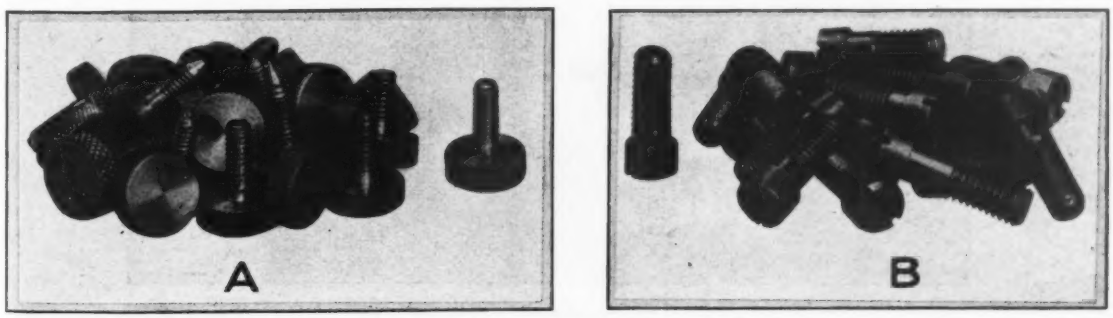


Fig. 1.

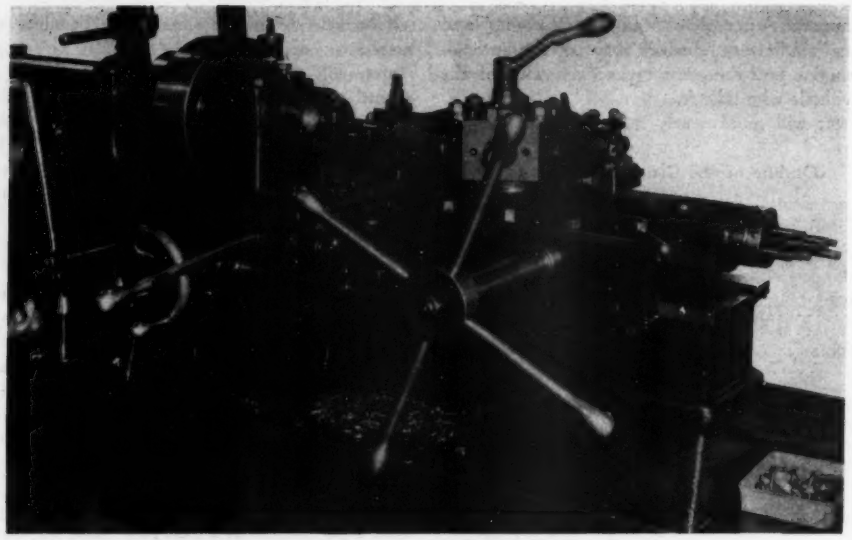


FIG. 2. SHOWING THE TURRET LATHE TOOLED UP FOR THE KNURLED THUMB SCREW "A".

how to operate the machine tools just enumerated, the boys are instructed in the use of special machines, in order to become familiar with their uses and operation.

During their last year at school, the students are allowed to specialize on any kind of work for which they wish to fit themselves, and it is during this time that they are usually able to construct one or more of the machines illustrated herewith.

In constructing these machines it is not only desirable to demonstrate how an individual machine can be built, but also how interchangeable parts can be used to advantage on different machines. This making of interchangeable parts prepares the student for conditions which he will meet in the manufacturing industry after leaving school.

In making some of these interchangeable parts the turret lathe has been put to good advantage. Figure 1 shows two parts, the knurled thumbscrews A and the bearing cap screws B. How and where these are used are indicated by *A* and *B* in the illustrations showing the machines.

Besides demonstrating to the student that duplicate parts can be made with greater speed and less cost on the turret lathe than on the engine lathe, this training also familiarizes him with turret-lathe operation and tooling methods. This is specially valuable because turret lathes are universally used in modern manufacturing plants.

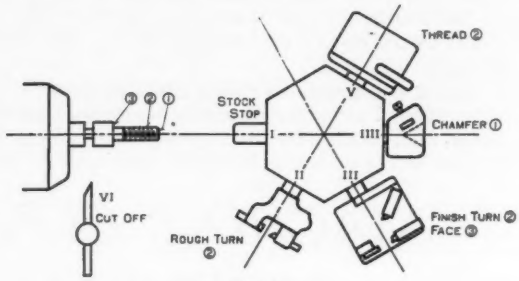
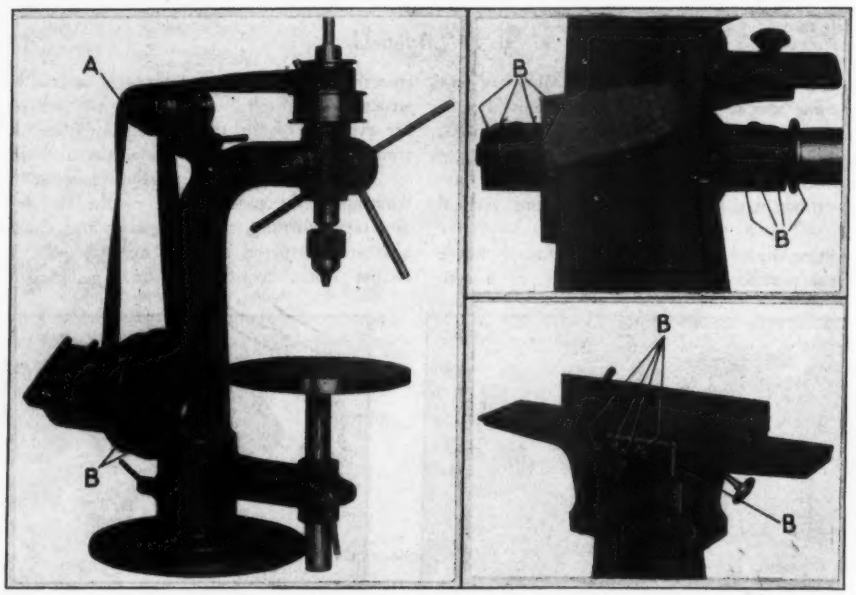


FIG. 3.



THIS ILLUSTRATION SHOWS HOW THUMB SCREWS *A* AND CAP SCREWS *B* ARE USED ON SMALL DRILL PRESSES AND JOINTERS.

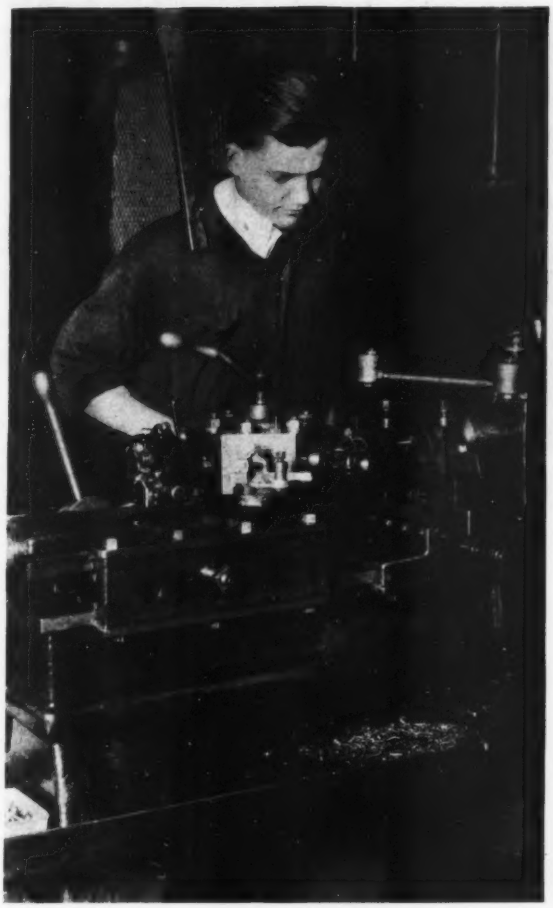


FIG. 4. SHOWING ONE OF THE STUDENTS OPERATING THE TURRET LATHE TOOLED UP FOR THE THUMB SCREW "A".

It is often thought, that a student trained on an engine lathe is well able to master turret-lathe operation in a comparatively short time. This is not true, as the tools used on a turret lathe are far different from those used on an engine lathe. Furthermore, a turret lathe makes several cuts at the same time, either with the same tool or with a tool on the cross slide and some other tool mounted on the hexagon turret. On the engine lathe, usually only one cut is taken at a time. This feature of "combined cuts" or "multiple cuts" requires that different problems are met on the turret lathe than on the engine lathe.

In addition to this, the turret lathe calls for cutter and tool adjustments, heavier feeds and faster speeds, and many other items that are not found on the engine lathe. This, then, makes it imperative that the student be given instructions and training on the turret lathe, so that he, as a future executive, will have some knowledge of the application of the turret lathe in modern manufacturing methods.

FIG. 8. SHOWING ONE OF THE STUDENTS OPERATING THE TURRET LATHE IN MAKING THE BEARING CAP SCREWS "B".

Figure 2 shows the turret lathe tooled up for the knurled thumbscrew A. The tooling layout for this piece is shown in Figure 3. It is made from ¾-in. brass rod, in lots of 50 pieces at one time and the operations are as follows:

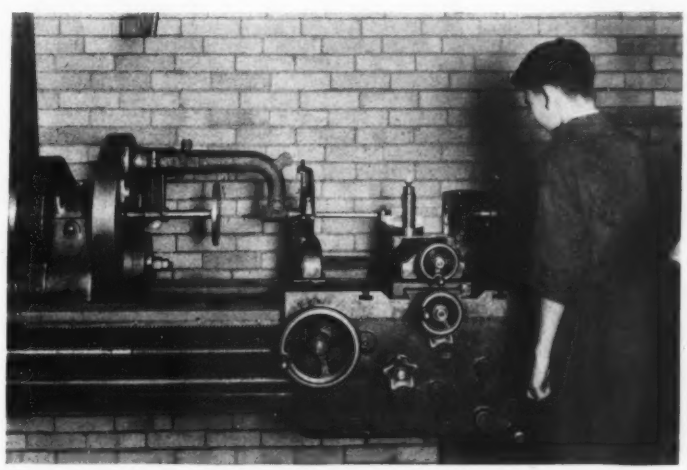


FIG. 5. A VIEW OF ONE OF THE STUDENTS DRILLING THE FRAME OF THE DRILL PRESS WHICH HE IS MAKING ON AN ENGINE LATHE.

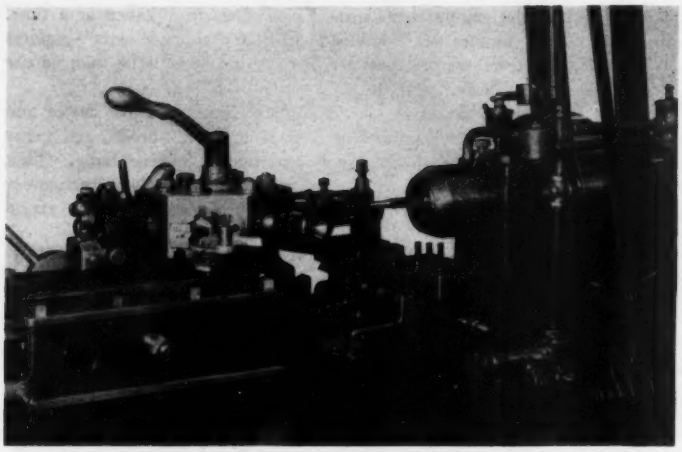


FIG. 6. SHOWING THE TOOLING EQUIPMENT FOR MAKING THE BEARING CAP SCREW "B".

I. Feed brass rod to stock stop for proper length.
II. Rough turn diameter (1) with single cutter turner mounted on the hexagon turret.
III. Finish turn diameter (1) and face (2), using a box tool holding two cutters. This is an example of the taking of "multiple cuts."
IIII. Chamfer (3) with chamfering tool.
V. Thread (4) with automatic opening die head.
VI. Knurl with knurling tool held in the rear tool post of the cross slide, particularly cutting off piece with cut-off cutter before knurling.
VII. Cut off piece with cut-off cutter which is held in the front tool post of the cross slide.

Figure 4 shows one of the students operating the turret lathe with the tools set up for this knurled thumbscrew. Figure 5 is a view of another student drilling the frame of a bench drill press which he is making on an engine lathe.

In Figure 6 the turret lathe is shown set up and tooled for the bearing cap screws B,

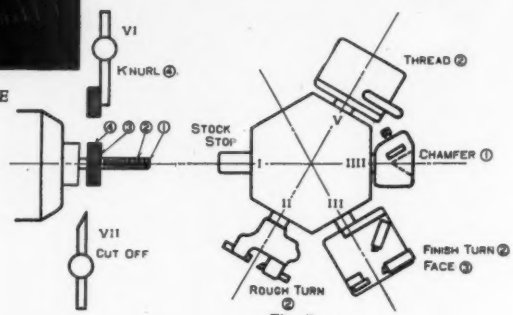
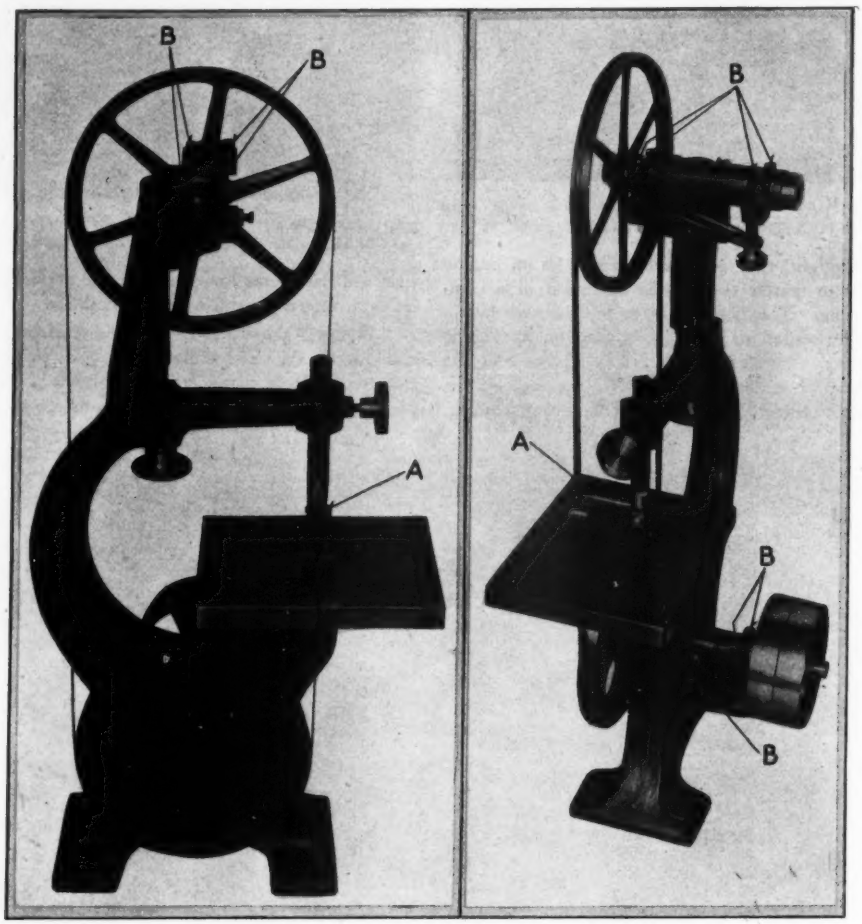


Fig. 7.



THIS ILLUSTRATION SHOWS HOW THUMB SCREWS *A* AND CAP SCREWS B ARE USED ON A SMALL BAND SAW.

while Figure 7 is the tooling layout for this piece. These cap screws are made of $\frac{9}{16}$-in cold-rolled bar stock, in lots of from 50 to 100 pieces.

Comparing this tooling layout with that of Figure 3, it can be seen that the same tools and tool holders are used again. Besides changing the turret stops to regulate the length of cuts the only other changes are to alter the length of stock at I, adjust cutters in the tools in positions II, III, and IIII, insert new chasers in die head at V, remove knurling tool used on the previous piece from the rear tool post on the cross slide. Only one tool post, the front one, of the cross slide is used for this job.

This is an interesting illustration of what is commonly known as a "permanent set-up" in which the tools and tool holders are permanently located and are not removed or altered in changing from one job to another. The only changes that must be made are those in the turret stops, and in the adjustment or changes of cutters and thread chasers.

Manufacturers of turret lathes and tools, supply these standard "permanent set-ups" for both bar and chucking work. From experience and investigation they have found out which tools are used the most, and they have made up sets of tools that will take care of a wide range of work. These tools are fastened on the hexagon turret and used from job to job without being removed.

The two screws discussed in this article are only a very few of the many parts that can be made profitably on a turret lathe. They show, however, that the training the students receive in making duplicate parts with rapidity and accuracy, give the turret lathe a great deal of educational value.

INFORMATION TEST FOR THE WOODWORKING DEPARTMENT

Paul N. Wenger, Lebanon High School, Lebanon, Pennsylvania

THE FOLLOWING TESTS are composed of 100 original questions pertaining to woodworking problems. They cover the common information of the school shop.

The tests have been divided as follows: No. 1, Use of Proper Tools; No. 2, Wood Fastenings; No. 3, Wood Finishing; No. 4, Kinds of Wood; No. 5, Lathe Work; No. 6, Patternmaking; No. 7, Care of Tools; No. 8, Shop Arithmetic Problems; No. 9, Miscellaneous Questions.

The tests should be given only to those students who have been exposed to experiences which are covered by the given test.

Teachers who make use of these tests are asked to send their constructive criticisms, and the results obtained from the use of the tests to the author. It is only by getting these reactions that the tests can be standardized.

Instructions for Taking Tests

The following instructions are to be attached to each of the tests:

Purpose of this test. These questions are aimed to help you find out how well you have advanced in the woodworking courses. After having followed the work for two or more years, you should have a broad view concerning the shop and shop practices. This test is designed especially for the boys who have completed the 8th or 9th grade, and who have had the courses for at least two years.

Directions. Below are a number of sections, each containing a number of items to be carefully considered, in relation to your ability or experience. In each case draw a line under the word or expression which you think is the correct one. The usual or most common answer is wanted. In case you are in doubt, use your best judgment. Take all the time you need.

Scoring. In the following questions each correct answer scores one point.

Samples.

1. Varnish is thinned with:
   1. Distilled water.
   2. Turpentine.
   3. Alcohol.
   4. Wood-filling solution.
2. As the mold sets on the floor ready for pouring, the top is called:
   1. Drag.
   2. Nowel.
   3. Cope.
   4. Cover.
3. It is desired to mark a board 14 inches wide and 22 inches long into square inches. How many square-inch spaces will be marked upon the surface?
   1. 268 square inches.
   2. 208 square inches.
   3. 408 square inches.
   4. 308 square inches.

Test No. 1

Use of the Proper Tools

1. The instrument used for boring holes in wood is called:
   1. Chisel.
   2. Bit.
   3. Needle.
   4. Screw.
2. The tool used for sawing off the end of a board is:
   1. Coping Saw.
   2. Compass saw.
   3. Crosscut saw.
   4. Ripsaw.
3. The name of the tool for smoothing a board is:
   1. Pumice stone.
   2. Gauge.
   3. Steel wool.
   4. Plane.
4. The end of a board is cut off at an angle of 45 degrees with:
   1. Miter saw.
   2. Ripsaw.
   3. Crosscut saw.
   4. Coping saw.
5. The tool used for making a hole slightly larger is:
   1. Countersink.
   2. Twist bit.
   3. Twist drill.
   4. Reamer.
6. Holes to fit the heads of flat-head screws, so that they may be sunk to the level of the board surface, are made with:
   1. Star drill.
   2. Countersink.
   3. Cone cutter.
   4. Drill.
7. A rasp is very similar to:
   1. File.
   2. Hammer.
   3. Awl.
   4. Saw.
8. The adjustment used on a bit for adjusting the depth is:
   1. Dado.
   2. Bit stop.
   3. Plate.
   4. Block.
9. A bit having an arrangement for varying the diameter of the holes to be bored is:
   1. Center bit.
   2. Gimlet.
   3. Expansive bit.
   4. Star drill.

10. For hammering upon a woodcutting chisel which tool should be used?
    1. Hammer.
    2. Mallet.
    3. Ax.
    4. Hatchet.
11. Hand screws are used for:
    1. Driving nails.
    2. Setting screws.
    3. Clamping.
    4. Cutting.
12. The instrument used for holding the bit while boring a hole is:
    1. Brace.
    2. Pliers.
    3. Pincers.
    4. Nippers.
13. The file is used for sharpening a:
    1. Knife.
    2. Chisel.
    3. Gauge.
    4. Saw.
14. The instrument for checking a 90-deg. edge is called:
    1. Triangle.
    2. Cube.
    3. Square.
    4. Protractor.
15. Circles may be drawn with a:
    1. Try-square.
    2. Compass.
    3. Nail set.
    4. Winding stick.

Test No. 2
Wood Fastenings

1. What do we call a nail after it has been sunk beneath the surface on varnished work?
    1. Braced.
    2. Set.
    3. Blocked.
    4. Lowered.
2. The nail most likely to split a board if not used properly is:
    1. Wire nail.
    2. Finishing nail.
    3. Cut nail.
    4. Lath nail.
3. Two boards may be fastened together temporarily with:
    1. Glazier points.
    2. Corrugated fasteners.
    3. Double-pointed tacks.
    4. Small staples.
4. Which kind of screws should be used when the screw head shall be level with the surface?
    1. Round-head.
    2. Fillister-head.
    3. Oval-countersunk.
    4. Flat-head.
5. Glue is made from:
    1. Animal tissue.
    2. Plant tissue.
    3. Chemicals.
    4. Minerals.
6. The surfaces to be glued together should be:
    1. Sawed straight.
    2. Painted.
    3. Shellacked.
    4. Planed flat.
7. A very small finishing nail is called:
    1. Cigar-box nail.
    2. Brad.
    3. Tack.
    4. Cut nail.
8. The most common joint found in fastening the sides of the table to the legs is:
    1. Dowel-pin.
    2. Mortise-and-tenon.
    3. Miter.
    4. Cross-lap.
9. When it is desired to set and conceal the head of a nail, which nail should be used?
    1. Wrought nail.
    2. Cut nail.
    3. Trunk nail.
    4. Finishing nail.
10. Drawers are usually constructed with what kind of joints?
    1. Dovetail.
    2. Mortise-and-tenon.
    3. Doweled miter.
    4. Dado.

Test No. 3
Wood Finishings

1. The pores in open-grained wood should be filled with:
    1. Putty.
    2. Paint.
    3. Wood filler.
    4. Shellac.
2. Which vegetable matter may be used as the basis for a wood filler?
    1. Flour.
    2. Cornstarch.
    3. Baking soda.
    4. Oatmeal.
3. Surface glue should be removed because:
    1. It is wasteful to leave it on.
    2. The instructor wants you to do it.
    3. It greatly increases the appearance of the project.
    4. It is good tool practice.
4. The purpose of rubbing shellac or varnish after it is dry is to:
    1. Make a smooth surface.
    2. Use the pumice stone and sandpaper supply.
    3. Follow the customary habit.
    4. Mix the previously applied finishing coats.
5. Stain is used on wood for:
    1. Filling the pores.
    2. A basis for other finishes.
    3. Making a moisture-proof finish.
    4. Changing the wood color.
6. The bottom of a table lamp should not be stained because:
    1. It spoils the appearance.
    2. It may stain the tablecloth.
    3. It will slide off the table more readily.
    4. It will cause it not to set level.
7. Shellac is usually thinned with:
    1. Benzine.
    2. Turpentine.
    3. Linseed oil.
    4. Alcohol.
8. Wood finishes are made by:
    1. Gane Brothers and Co., New York, N. Y.
    2. Thomas Garman and Co., New York, N. Y.
    3. S. C. Johnson and Co., Racine, Wis.
    4. Barnhart Bros. and Spindler, Chicago, Ill.
9. A varnish coat is usually dry within:
    1. Several minutes.
    2. Several days.
    3. One hour.
    4. Two hours.
10. Wax is usually used as:
    1. The basis for a shellac coat.
    2. The basis for a varnish coat.
    3. A crevice filler.
    4. As a finishing polish.

Test No. 4
Kinds of Wood

1. In the following list, which is the hardest?
    1. Bass.
    2. Gum.
    3. Fir.
    4. Elm.
2. Which is the softest?
    1. Rosewood.
    2. Cedar.
    3. Oak.
    4. Mahogany.
3. Which is the most open-grained?
    1. Chestnut.
    2. Cherry.
    3. Maple.
    4. Poplar.
4. Which wood makes the best bow for the archer?
    1. Yew.
    2. Redwood.
    3. Red gum.
    4. Butternut.
5. Which wood is usually used for arrow shafts made from dowel pins?
    1. Walnut.
    2. Ebony.
    3. Birch.
    4. Sycamore.
6. The wood least affected by water and dampness is?
    1. Myrtle.
    2. Cypress.
    3. Oak.
    4. Gum.

7. Cracks in the end of sawed-off timber are called:
   1. Splits.
   2. Grooves.
   3. Warps.
   4. Checks.
8. Lumber for molding is usually sold by:
   1. The square foot.
   2. The board foot.
   3. Weight.
   4. The linear foot.
9. Cedar chests are popular because:
   1. They are cheap.
   2. They are moth proof.
   3. They readily match other pieces of furniture.
   4. They are most substantial.
10. In making a bill of material which dimension should be stated first?
    1. Width.
    2. Thickness.
    3. Length.

Test No. 5
Lathe Work

1. For making the bead on the stem of a table lamp, the proper tool to use is the:
   1. Small round-nose chisel.
   2. Large round-nose chisel.
   3. Skew.
   4. Square-nose chisel.
2. The proper tool to use for making a cove cut is the:
   1. Parting tool.
   2. Calipers.
   3. Dividers.
   4. Gouge.
3. For staining or shellacking a finished cylinder the lathe should be running:
   1. At first speed.
   2. At second speed.
   3. At third speed.
   4. Slowly, by turning the handwheel.
4. The tool used for inlaying lathe projects is:
   1. Parting tool.
   2. Round-nose chisel.
   3. Gouge.
   4. Skew.
5. One would use the faceplate for making the:
   1. Stem of a table lamp.
   2. Base of a floor lamp.
   3. Baseball bat.
   4. Mallet handle.
6. The instrument for holding the center bit while boring a hole through a lathe project is called:
   1. Live center.
   2. Handwheel.
   3. Brace.
   4. Chuck.
7. The instrument for taking the diameter of a wood product being turned in the lathe is called:
   1. Micrometer.
   2. Calipers.
   3. Thermostat.
   4. Lathe dog.
8. The tool used for roughing a square rod to a cylinder is:
   1. Gouge.
   2. Parting tool.
   3. Round-nose chisel.
   4. Bracket.
9. Wood should be fastened to the faceplate with:
   1. Nails.
   2. Glue.
   3. Screws.
   4. Wire.
10. Which method is commonly used for finding the center of a square piece of wood to be turned between the two lathe centers?
    1. Swinging arcs with the compass.
    2. Drawing diagonals.
    3. Measuring and squaring off the distance.
    4. Guessing.

Test No. 6
Patternmaking

1. Patterns are usually given:
   1. Varnish finish.
   2. Linseed-oil finish.
   3. Natural finish.
   4. Shellac finish.
2. The pitch given to a pattern so that it can be easily removed from a mold is called:
   1. Taper.
   2. Draft.
   3. Slope.
   4. Slant.
3. The pattern that makes allowance for double shrinkage is known as:
   1. Master pattern.
   2. Ordinary pattern.
   3. Under-size pattern.
   4. Enlarged pattern.
4. The wood used for patterns is:
   1. Oak.
   2. Maple.
   3. White pine.
   4. Cypress.
5. Core prints are usually:
   1. Left natural.
   2. Painted black.
   3. Shellacked.
   4. Painted white.
6. The machine used for working down a depression to a definite depth is:
   1. Mortise machine.
   2. Dovetail machine.
   3. Router.
   4. Sander.
7. A sharp corner (90 deg.) is usually rounded out at the joints with:
   1. Putty.
   2. Wood filler.
   3. Leather fillets.
   4. Glue.
8. The instrument for measuring, used in patternmaking is:
   1. Shrink rule.
   2. Ordinary foot rule.
   3. Metric rule.
   4. Yardstick.
9. The metal used in the shop for making a trial casting from a pattern is usually:
   1. Copper.
   2. Brass.
   3. Lead.
   4. Tin.
10. Patterns are made:
    1. Regular size.
    2. Over size.
    3. Under size.

Test No. 7
Care of the Tools

1. In sharpening a chisel the bevel should be about:
   1. Ten degrees.
   2. Twenty degrees.
   3. Forty degrees.
   4. Fifty degrees.
2. The angle formed by the edge of a cabinet scraper with the side of the scraper is:
   1. Twenty degrees.
   2. Thirty degrees.
   3. Sixty degrees.
   4. Ninety degrees.
3. A wood chisel should never be used:
   1. As a screw driver.
   2. For cutting a stop chamfer.
   3. For cutting hardwood.
   4. For cutting a joint to size.
4. To keep tools in good condition, when stored away for several months, they should be:
   1. Stored in a damp place.
   2. Resharpened before packing.
   3. Covered with a nonrust solution.
   4. Packed in sawdust.
5. Nicks in the plane cutters are caused by:
   1. Planing too rapidly.
   2. Planing into metal pieces.
   3. Planing hardwood.
   4. Planing across the grain of the wood.
6. The teeth of the saw are set so that:
   1. They have more strength.
   2. The saw blade will not wedge fast.
   3. They can be sharpened more readily.
   4. They will not become dull readily.
7. Tools should not be exposed to moisture because:
   1. They do not need washing.
   2. It will cause them to rust.
   3. It is considered a poor practice.
   4. It will make them more flexible.
8. If I should find the plane at my desk to be very dull; and, if I needed a plane, I would:
   1. Complain to my partner.
   2. Use another person's plane.

3. Lay aside the work for that period.
4. Sharpen it before using.

9. If I desired to test the edge of a cutter, I would try it by cutting into:
   1. The workbench.
   2. Another person's project.
   3. A small piece of scrap wood.
   4. One of the display shelves.
10. A ripsaw is quickly dulled by:
   1. Sawing across the grain.
   2. Sawing wood that has not been properly seasoned.
   3. Sawing hardwood.
   4. Sawing into a nail or other pieces of metal.

Test No. 8
Shop Arithmetic Problems

1. A 2-in. cylinder shall be turned so as to have four ½-in. beads. The remaining diameter of the cylinder between the beads would be:
   1. One half inch.
   2. One inch.
   3. One and one fourth inches.
   4. One and one half inches.
2. A 2-inch cylinder shall be turned so as to have four ½-inch coves. The smallest diameter upon the cylinder would measure:
   1. One half inch.
   2. Three fourths inch.
   3. One inch.
   4. One and three fourths inches.
3. To change the diameter of a 4-inch cylinder to a 1-inch cylinder the tool must penetrate a depth of:
   1. Two inches.
   2. One half inch.
   3. Three fourths inch.
   4. One and one half inches.
4. A circular piece of wood 1 inch thick and having a radius of 6 inches shall be used for the base of a hexagonal wastebasket. The length of each side of the hexagon (using the 6-inch radius circle) would be:
   1. Three inches.
   2. Four inches.
   3. Six inches.
   4. Eight inches.
5. If a piece of wood 1 inch thick shall be cut into a triangular piece having one leg equal to 3 inches, and the other leg equal to 4 inches, the length of the longest side (hypotenuse) would be:
   1. Four and one half inches.
   2. Five inches.
   3. Five and one half inches.
   4. Six inches.
6. The cylinder sander happens to have a diameter of 6 inches and a length of 12 inches. It is to be covered with sandpaper. Allowing 1 inch, or less, for the seam, the length necessary for covering it would be:
   1. Sixteen inches.
   2. Nineteen inches.
   3. Twenty-two inches.
   4. Twenty-five inches.
7. A boy makes a box 8 inches long, 6 inches wide, and 4 inches deep (inside measurements). The box has a capacity of:
   1. 152 cubic inches.
   2. 172 cubic inches.
   3. 192 cubic inches.
   4. 212 cubic inches.
8. A boy desires to make a bread board having a surface area equal to 57 square inches. The width of the board shall be 6 inches. Therefore its length must be:
   1. Eight inches.
   2. Ten inches.
   3. Eight and one half inches.
   4. Nine and one half inches.
9. A table drawer has the following inside dimensions: Three inches deep, 9 inches wide, and 15 inches long. The number of 3-inch cubes that can be placed in the drawer is:
   1. Nine.
   2. Twelve.
   3. Fifteen.
   4. Eighteen.
10. The greatest number of 2-inch squares (allowing ⅛ inch for each saw cut) that can be cut from a piece 2 inches wide and 24 inches long is:
   1. Ten.
   2. Eleven.
   3. Twelve.
   4. Thirteen.

Test No. 9
Miscellaneous Questions

1. Planing off timber on the corner is called:
   1. Shaping.
   2. Cutting.
   3. Butting.
   4. Chamfering.
2. "The Industrial-Arts" is the name of a:
   1. Finishing product.
   2. Magazine.
   3. Newspaper.
   4. Lathe machine.
3. The directions a woodworker usually follows while working are:
   1. Stated upon a blue print.
   2. Stated upon a tracing sheet.
   3. Stated in a large book.
   4. Given to him verbally.
4. The figure on a saw states:
   1. The number of teeth per inch.
   2. Thickness of the teeth.
   3. Set of the teeth.
   4. Length of the saw.
5. Many shop tools are made by:
   1. The Shaler Company.
   2. Robbins and Myers Co.
   3. Stanley Company.
   4. Bauer and Black.
6. A bit has the figure "8" upon it. The hole it will bore is:
   1. One sixth inch.
   2. One fourth inch.
   3. One half inch.
   4. One third inch.
7. The cut of a saw is called:
   1. Groove.
   2. Saw space.
   3. Saw line.
   4. Kerf.
8. The saw revolving about a common center is called:
   1. Hand saw.
   2. Band saw.
   3. Circular saw.
   4. Gang saw.
9. The bisecting line (running lengthwise) of a 2-inch lath would be marked with:
   1. Yardstick.
   2. Marking gauge.
   3. String.
   4. Tape measure.
10. Which instrument would be used for measuring whether or not the shaft is level?
   1. Foot rule.
   2. Plumb line.
   3. Straight edge.
   4. Spirit level.
11. The fine shavings from the edge of a number of thin steel discs form what is known as:
   1. Steel wool.
   2. Hair steel.
   3. Steel strings.
   4. Fine wire.
12. The part of a chisel that is ground away for sharpening it is called:
   1. Blade.
   2. Shank.
   3. Bevel.
   4. Ferrule.
13. The sand used in making sandpaper is usually:
   1. Gravel.
   2. Quartz.
   3. Limestone.
   4. Sandstone.
14. If you desire to know the next step in your project:
   1. Ask the other pupils.
   2. Ask the instructor.
   3. Look up the process in the library books.
   4. Guess at it.
15. Before leaving your bench at the end of the period:
   1. Be sure that all your tools and materials are properly placed.
   2. Complain about the equipment.
   3. Tell your partners when it is time to stop.
   4. Plan to leave the room first.

Correction List
Test No. 1

1..... 2	6..... 2	11..... 3
2..... 3	7..... 1	12..... 1
3..... 4	8..... 2	13..... 4
4..... 1	9..... 3	14..... 3
5..... 4	10..... 2	15..... 2

Test No. 2

1..... 2
2..... 3
3..... 2
4..... 4
5..... 1
6..... 4
7..... 2
8..... 2
9..... 4
10..... 1

Test No. 3

1..... 3
2..... 2
3..... 3
4..... 1
5..... 4
6..... 2
7..... 4
8..... 3
9..... 2
10..... 4

Test No. 4

1..... 4
2..... 2
3..... 1
4..... 1
5..... 3
6..... 2
7..... 4
8..... 4
9..... 2
10..... 2

Test No. 5

1..... 3
2..... 4
3..... 4
4..... 1
5..... 2
6..... 4
7..... 2
8..... 1
9..... 3
10..... 2

Test No. 6

1..... 4
2..... 2
3..... 1
4..... 3
5..... 2
6..... 3
7..... 3
8..... 1
9..... 3
10..... 2

Test No. 7

1..... 2
2..... 4
3..... 1
4..... 3
5..... 2
6..... 2
7..... 2
8..... 4
9..... 3
10..... 4

Test No. 8

1..... 2
2..... 3
3..... 4
4..... 3
5..... 2
6..... 2
7..... 3
8..... 4
9..... 3
10..... 2

Test No. 9

1..... 4
2..... 2
3..... 1
4..... 1
5..... 3
6..... 3
7..... 4
8..... 3
9..... 2
10..... 4
11..... 1
12..... 3
13..... 2
14..... 2
15..... 1

INDUSTRIAL-ARTS CONTESTS AND EXHIBITS

S. M. Dell, Marion High School, Marion, Kansas

JUST HOW ESSENTIAL to industrial arts are contests and exhibits is difficult to determine. Their merits can be judged only by the reasons for having contests and exhibits, and by the benefits derived after they have been used. It is agreed by all that contests and exhibits can be made to fill a large place in the course, provided the instructor has sufficient knowledge of the purposes and principles involved.

In order that there may be a common understanding of the terms as they apply to industrial arts, contests may be defined as striving for some goal where the motivating factor is of secondary importance to the knowledge gained in securing this goal. Exhibits then may be defined as the submitting in public or private, of the finished project for approval.

Before any contest can be made a success, a study of the objectives must be made, and if certain specific reasons for having a contest cannot be found, the contest is certain to be a failure. A contest for the contest's sake is worse than no contest at all. Some of the most fundamental objectives are discussed in the following:

First: Contests create greater interest in industrial-arts work. The junior- and senior-high-school boys are admirers of contestants and heroes of any kind, and consequently the spirit of competition is keen. The boys are glad for an opportunity to enter into a contest, hence great interest is manifested. Often it is not necessary to have money prizes; a ribbon or certificate being sufficient reward to please the boy, since the satisfaction of the honor of first or second place is enough reward.

Second: Production will be stimulated. If the boys are interested more time will be spent working, which means

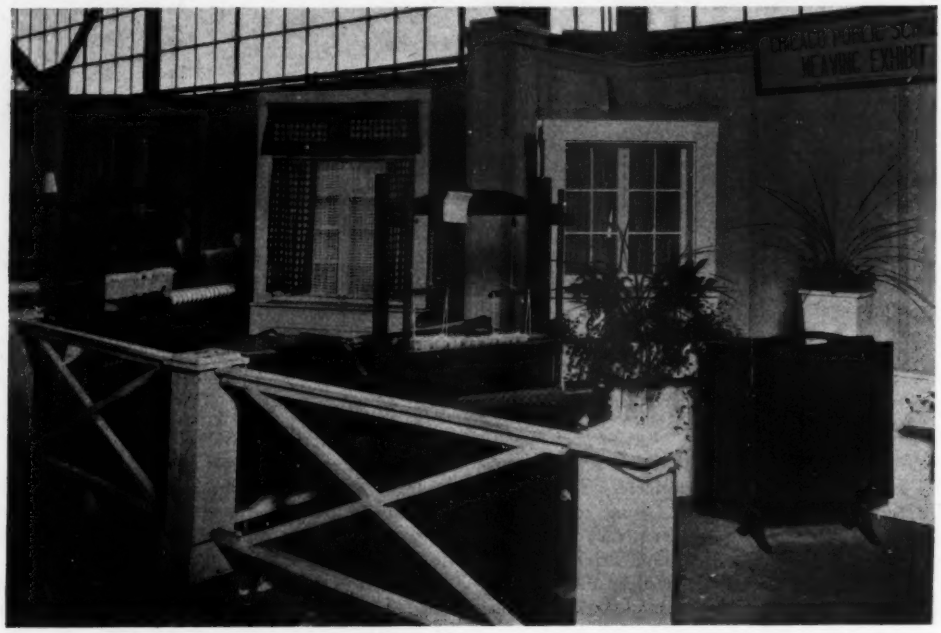
A COMMON-SENSE WAY OF ARRANGING AN EXHIBIT. SUBMITTED BY E. A. LAIR, JACKSONVILLE, ILL.

greater production. In contests when a certain length of time for making projects is given, production is very much stimulated as the boys have a desire to finish projects so as to be able to compete. Time at home and after school will be utilized.

Third: A higher standard of workmanship will be obtained. The boys will feel that they must plan and work their very best if they are to win. Projects in contests are always judged for workmanship, hence joints must fit perfectly and the whole project must be done in the best possible manner in order to win the prize. Their grades will be forgotten and the workmanship will tend towards perfection without any thought of attempting to "get by."

Fourth: Contests stimulate originality. Industrial arts encourage originality, consequently, projects in contests are judged for originality. This being true, the boy will work his originality to the limit trying to be more original than some other boy. In this way originality is rewarded and the course derives the benefits of this originality.

Last but not least: Contests help to sell industrial arts to the community. This statement, at first thought, may sound a little out of place, but boys in contests are going to talk projects at home. They may work on them at home, in fact, they should be encouraged to do so. They ask questions of their parents, such as only boys can ask; questions of construction, of finishing, or of practicability. Everyone knows how parents come to programs in which their children are participating. Likewise, if Willie has a bird house in a contest they want to see how it compares with the rest of the houses. Whether Willie wins or not, the chances are they are more willing to help him next time. They thus become boosters for industrial arts.



AN EXHIBIT IN WHICH NOT ONLY THE WORK BUT ALSO THE STUDENT IS DISPLAYED.

If industrial arts is beneficial, why "put it under a bushel"?

Any of the above reasons should be sufficient to convince the teacher of the practicability and need for contests and exhibits of manual-training projects.

Contests for the Junior High School

Many types of contests have been used successfully in the junior high school. Some of the most common will be discussed.

The construction of bird houses affords a type of problem

MANUAL-TRAINING EXHIBIT STAGED IN THE GYMNASIUM OF THE HIGH SCHOOL AT WINFIELD, KANS. NOTE HOW THE WALL SPACE IS UTILIZED.

that is always interesting and that has considerable merit from the standpoint of the best aims of manual training. Bird house building develops originality and initiative, gives the boys a glimpse of community interests, and affords the community a point of contact with the schools.

The bird-house contest is one that has been used more and with greater success than most of the other types. In some cases they have been sponsored by a local organization of business men, or a local organization which has for its purpose the preservation of bird life, and usually conducted by the school.

Recently in New York a bird-house contest was conducted for the 7th- and 8th-grade boys. The time for preparation was limited to four weeks and of the 65 entries, 50 were completed. Any type of house could be entered and they were judged on suitability, workmanship, general appearance, and originality. The judges consisted of two carpenters, and a man who had a hobby of making bird houses. The board of education furnished the $40 prize money and the boys furnished practically all the lumber by securing boxes and crates from the stores in town. The houses were, of course, exhibited for public appreciation.

Buffalo, N. Y., put on a big city-wide bird-house contest involving four types of houses. First type for bluebirds, tree swallows, and nuthatches. Second type for house wrens, chickadees, and robins. Third type for crested fly catchers, redheaded woodpeckers, and flickers. Fourth type, a more or less miscellaneous group, consisting of bird baths and feeders. The prizes were awarded (1) for uniqueness, (2) for workmanship and skill, (3) for design, (4) for ingenuity. They were judged on practicability, 50 per cent; workmanship, 35 per cent; and uniqueness, 15 per cent.

The above examples will give a fairly good idea of the possibilities of the bird-house contests, and since the range is unlimited, the instructor must decide on the type most suited to his need.

It might be well to issue a word of warning relative to bird-house building. Be sure the birds for which your boys build houses live in that section. Several years ago a bird-house building program was put on in a western Kansas town and since their houses were not occupied, the instructor discovered, upon investigation, that the houses were made for birds that did not live in that locality. Possibly the surest way to overcome this disadvantage would be to have every boy make a study of the bird he is planning to build a house for, and submit a short composition on the life habits of the bird, the best location for the house, and the value of the bird to the community.

The surest way of getting a community interested in any subject, is to first get the children interested. Once the parents are interested, the children's interest will be much more likely to be maintained. Frequently a contest involving model houses and buildings is used, and is one that might well follow bird-house construction. One of the most outstanding contests of this type was "Tinytown" conducted at Springfield, Mo. The idea was originated by the Director of Publicity for "Build Now" campaign of the Chamber of Commerce and was put on by the schools of the city. The chief feature of the campaign was the building of a miniature city by the students of the manual-training departments of Springfield's eighteen schools. A total of 1,000 houses were built in the ten weeks allowed for the work. Prizes were awarded to schools and individuals for the best work, so it is easy to see that the program was carried into about a thousand homes and the progress of the contest was the daily discussion in those homes. The houses followed in miniature, correct plans of houses. The houses were built on the scale of ½ in. to 1 ft., and when completed represented a city of 155 acres, laid out with streets, parks, grass, and flowers.

It could not be expected that many schools or towns could put on as fine a contest as the above mentioned, but frequently real estate firms are interested in contests involving buildings and will buy those houses that might be for sale. Departmental stores also could use them for decorative purposes. Surely in small schools the results of this type of contest would be nearly as gratifying as in the large school and is one that could well be considered.

The contest most frequently used and the simplest to use with junior-high-school boys, and boys of the lower grades, is the toy contest. It may be held just before Christmas, and the toys may then be sold at auction or private sale after they have been judged. It is the time of the year when boys are most interested in toys and the time when the most original ideas can be put into form. The scope of this project is almost limitless and a toy contest almost always proves successful.

Toy contests may be divided into the following groups: (*a*) Boats, (*b*) automobiles, (*c*) engines, (*d*) airplanes, (*e*) games, (*f*) animals, (*g*) miscellaneous. This may be judged by methods discussed later. Sometimes it is advisable in smaller schools, in order to have sufficient numbers alike to judge, to limit the contest to certain types of toys, as automobiles and tractors, or animals for the circus or ark, etc.

Another type which will work very successfully in certain sections is a kite, or yacht, contest and tournament, judging the finished product partially by its ability to fly or sail. Both of these types have been used very successfully.

Contests for the Senior High School

The problem of contests in the senior high school appears to be more difficult than in the junior high, yet several types have been made to function reasonably well and should be able to give good results. In many places county contests are held, each school in the county having the opportunity to enter projects and compete for prizes, being judged by a method that has been previously agreed upon. This type is, of course, handicapped by the difficulty of getting projects to the place of contest, and the likelihood of marring their beauty and finish, with the result that a number of projects will not be shown. These disadvantages can be partially overcome in cities having more than one school, by holding a city contest. In cities not having more than one school, a local school contest could be held. However, another method, which may be superior, would be for the instructor to judge the work during the entire year, taking into consideration the student's ability to make his drawings, tracings, and blue prints; his design, ability to lay out and square up stock, make joints, glue, finish, and so on; the time taken on individual parts and the finished project. It would seem that this method would have the advantage over all others in that it would last the whole year and would stimulate the boy to make each part his best, to plan ahead, to save time and to avoid mistakes.

The subject of exhibitions in industrial arts is so closely correlated with contests that one cannot be discussed without discussing the other. Seldom, if ever, are contests held without exhibiting the projects to the community. While, in a way, the same principles will hold true for both contests and exhibits, the motivating factor of exhibits is surely lacking to a more or less degree. Contests are, of course, to be recommended, but if for reasons justifiable, contests cannot be conducted, then exhibits are to be most heartily recommended. If a bird-house contest is held, then, of course, there will be an exhibit of bird houses, and so on with any kind of contest to be held. Since types of contests have been discussed, it will not be necessary to mention them again relative to exhibits.

Probably the most common type of exhibit is one that might be termed "Open-House Display." The people of

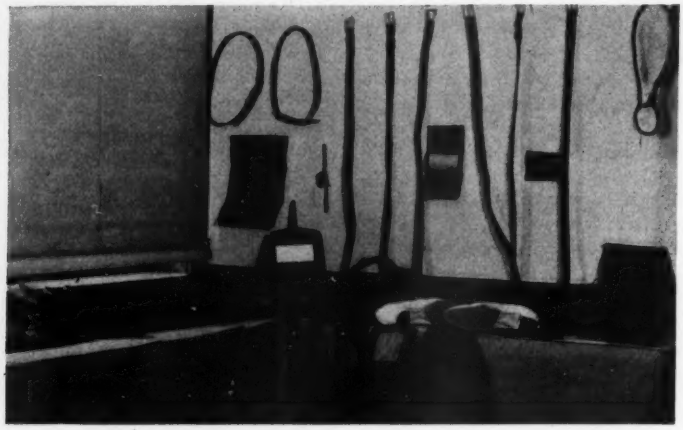
the community are invited to become better acquainted with the work of the school. Each department is expected to make an exhibit of the type of work it is doing. A display of the entire year's work is advisable, or at least a display of the types of work being done. In some schools the industrial-arts exhibit is held during the time art pictures are being exhibited, and in this case instead of "Open-House Display," it may be called "Art Exhibit."

At the McPherson High School, McPherson, Kans., several years ago the boys spent three or four weeks previous to Christmas, making toys and various other projects in demand at Yuletide. A few days before Christmas, the projects were exhibited in several of the most attractive store windows in town. They were advertised for sale, but of course could not be taken away until the day before Christmas. This made a very attractive display and the toys were all disposed of at a price intended to pay a little more than cost. This is a type of exhibit that should work well in every town and one that will bring very gratifying results to the instructor.

Special trade exhibits are recommended and will be beneficial for such types of work as art fiber, weaving, cabinet work, etc.

Another type beneficial to the department and as a stimulation to the boys, is a display case in the shop. In this case the best projects are placed for exhibit and left during the year.

A simple exhibit may be made by the boys from samples of wood from the native trees. This would be very beneficial both to the boys and the department.

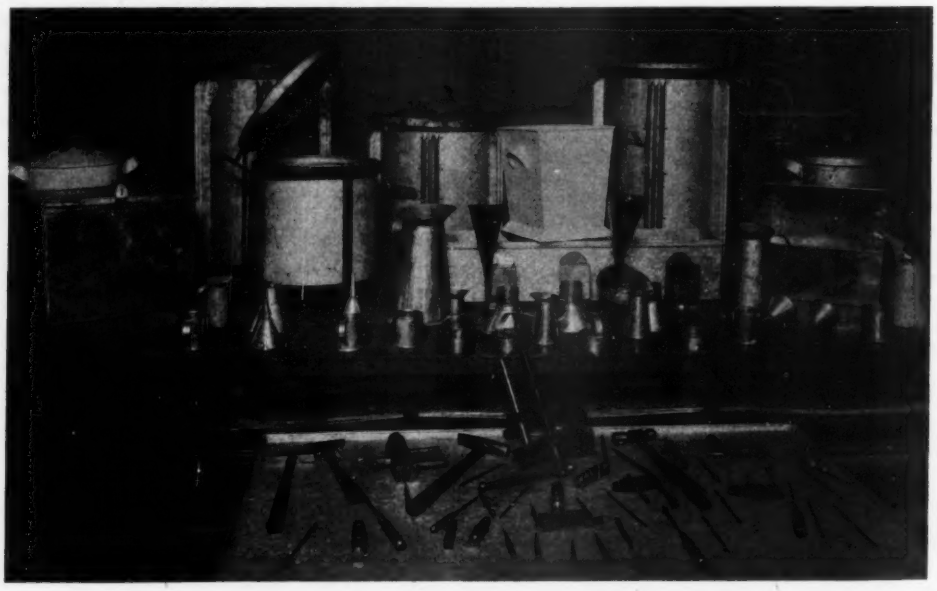


A LEATHER WORK EXHIBIT. SUBMITTED BY C. A. KUNOU, SUPERVISOR OF MANUAL EDUCATION, LOS ANGELES, CALIFORNIA.

Other exhibits worthy of mention are the Boys' Achievement Week exhibit, local exhibits, state teachers' convention exhibits, and window displays in local stores.

From the above list the instructor can doubtlessly find uses for many more types of exhibits and ones that will meet his needs as successfully as these.

Probably the greatest reason why more contests are not held is due to the fact that the instructors are not familiar with the methods of conducting them. When cash prizes are



A SHOP EXHIBIT OF WORK DONE IN THE SHEET-METAL AND MACHINE-SHOP DEPARTMENT. SUBMITTED BY HIRAM E. GREINER, FORKS, ERIE COUNTY, NEW YORK.

to be given and expenses are involved, the problem of financing contests is one that may put a damper on the enterprise. However, many organizations and individuals are glad to have their money used for boys' contests.

The schools boards are, of course, very much interested and in some instances have given as much as $50 to be used as prize money. But it is questionable whether school funds can be legally used in this way. Rotary and Kiwanis clubs always have committees on boys' work and are usually glad to help if asked. Women's clubs are interested especially in bird-house contests, or in contests where the projects go to some charitable cause. In some towns there are civic organizations which have for their motive the protection of wild life. These organizations are always glad to help out on bird-house contests. Then, too, there are many individuals with plenty of money who would enjoy giving for this type of work and usually there are some who are especially interested in boys' work. In Springfield, Mo., the people gave $5,000 for "Tinytown."

Lumber associations and dealers are interested especially in model houses, and building, and will help finance it if they have opportunity to buy the houses after the contest. Real estate dealers are almost always glad to help if they, too, can have opportunity of buying the houses after the contests. Various other business firms will be interested, depending on the specific type of contest.

The judging of projects in contests presents various questions. For example: Shall bird houses and toys be judged in the same manner as library tables and radio cabinets? If not, then what are the points each should be judged by? If so, how are they to be judged?

Bird houses and toys are judged by various methods. Recently in a contest they were judged in the following manner: Practicability, 50 per cent; workmanship, 35 per cent; uniqueness, 15 per cent. Regular projects have been judged: Artistic merit, 30 per cent; workmanship, 30 per cent; adaptability or fitness to purpose, 40 per cent. In a local county contest, only workmanship was considered, keeping in mind the following points: Design, methods of construction, accuracy, finish, adaptability, and originality.

Many other points might be considered, but it seems some of the most logical to be considered should be *general appearance*, which takes into consideration proportion, finish, and design; *workmanship*, which includes methods of construction and accuracy, *suitability* to purpose, which considers size, design within construction, and type as to usability; *adherance to type*, considering whether the project conforms to the type for which it is intended. *Originality* is frequently mentioned but it is doubtful if it can be successfully determined by anyone except the instructor who has watched the project in construction.

There are several features to be guarded against in contests so that each school and individual may have equal chances. For that reason schools should not be permitted to show a complete set in competition with other schools unless each school is showing a complete set. As an example, one school showing a complete bedroom set against a school showing various projects should not be permitted. The number of projects to be entered should be limited. Such projects known as "ready-cut" and all projects that need only to be assembled and finished should not compete with the regular projects. Weaving, and art-fiber projects should not be permitted to compete with the regular woodwork projects. Neither should grade- or junior-high-school students compete with senior-high-school students in contests of any type.

The securing of suitable judges is comparatively easy in most places since all towns have carpenters who can judge the projects for workmanship, general appearance, and practicability. Industrial-arts teachers from nearby towns are usually good, and the college industrial-arts instructors are especially to be recommended. Should there be men or women who have hobbies along certain lines, especially bird houses and toys, they make exceptionally good judges on originality and uniqueness. Practical business men and women can of course be used to do the judging, and in many cases at least one should be used. It is recommended that the judges be composed of a carpenter, an instructor, and a business man, rather than that all be carpenters or all business men. In large contests where more than one type of work is to be judged, as toys, bird houses, model houses, cabinet work, etc., it is recommended that there be judges for each type. In every case the most competent judges should be secured so as to avoid criticism, especially from the contestants.

The arrangements of projects is a problem which certainly cannot be discussed with final authority because condi-

SHOP EXHIBIT OF WORK DONE BY THIRD, FOURTH, FIFTH, SIXTH, AND SEVENTH GRADE PUPILS, PRINCE EDWARD SCHOOL, WINDSOR, ONTARIO, CANADA.

tions will vary with every contest or exhibit. Some of the most fundamental essentials will be discussed and your own conclusions may be drawn.

In the first place, the room or space where the exhibit is to be located must be sufficiently large to hold all projects without crowding, whether it be the manual-training room, the gymnasium, auditorium, display window, or tent. Crowding always makes projects show at a disadvantage.

Small projects, when placed stair-step fashion on tables, show to a splendid advantage. This can be accomplished by building up on sawhorses with boards, or from the floor if sufficient number of projects warrant it. They can, of course, be shown on flat tables if they cannot be placed otherwise.

Large projects may be grouped attractively around the walls or in the center of the room, or both, letting the visitors pass on one side in the case of the wall grouping and around the projects when grouped in the center of the room.

It seems to be a characteristic of children, and grown-ups as well, to rub their hands on highly polished projects, even though "hands off" signs be placed conspicuously near. For this reason roping off as attractively as possible the path of the visitors seems the best solution.

The electrical lighting of exhibits is an essential which cannot be overlooked. At a recent exhibit of various types of industrial projects, the light shades were covered with red crêpe paper. This produced a most harmonizing effect on the finishes while defects of workmanship, if any, were unnoticeable. Bridge lamps, floor lamps, table lamps, and so on, in exhibits always appear best when lighted with a mellow, subdued light. A sufficient number of double and triple sockets may be borrowed from homes and stores to accomplish the lighting satisfactorily.

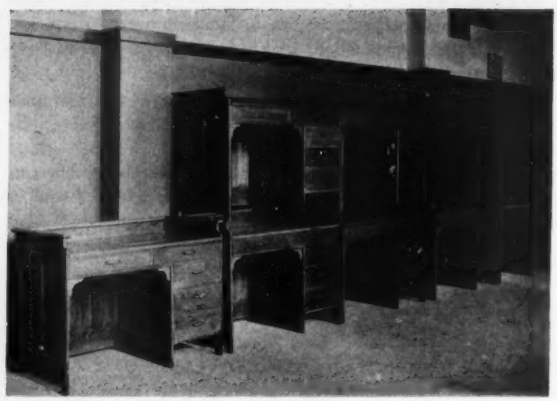
Frequently, when an exhibit is placed in the display window of a store, the decorator of the store agrees to arrange the project so all will appear to the best advantage, using whatever facilities the store may have to accomplish this. However, not every instructor can be so fortunate. One must often do his own arranging with the help of the boys. A few dollars spent for paper doilies, crêpe paper, plain white paper, electrical fixtures (if any have to be bought), table runners, etc., is certainly money well spent. These can be kept and used on future occasions. In a recent interview with an instructor relative to the decorative factors of exhibits, he stated that if he needed a table runner or anything of like character he could go to a store and borrow it. In fact, all of the stores were glad to lend anything they might have which would add to the beauty of the projects. It is well to remember when store goods are borrowed they should be taken back in just as good condition as when received, hence in exhibits where it is possible for people to put their hands on projects it would be better not to use borrowed material.

Bird houses look best if arranged in a natural setting. A few branches and trees will help produce this setting besides adding to the beauty of the exhibit.

The subject of prizes and awards should be thoroughly considered before proceeding too far.

In most schools the common prize is money, varying from one to ten dollars for the first prize. The most common is five dollars for the first prize, three for the second, two for third, and ribbon for the fourth. Money prizes are fine but if several contests are held each year it means a considerable sum. Once it is started it is very difficult to change. Many instructors have a feeling that where more than one contest is given in a year, money prizes should not be given in more than one with a possibility of no money prizes at all. Then, of course, comes the question of what to use.

In winning first or second prize it should be the honor that is considered rather than its monetary value. Consequently, then, if a ribbon is awarded the honor will be the outstanding factor. In county contests, pennants should be awarded to the winning school, and ribbons to the individuals. In contests involving only one school, certificates of award should be granted by the school officials.



AN EXHIBIT OF DESKS MADE BY STUDENTS OF THE MECHANIC-ARTS DEPARTMENT, JEFFERSON HIGH SCHOOL, PORTLAND, OREG.

The time of the year to hold contests scarcely deserves mention since they are so often held on regular dates. Birdhouse and toy contests usually are held just before the Christmas holidays. The best time for a regular project contest is near the close of a school or end of the first semester. The placing of a time limit on the preparation of toys and bird houses for contests is the logical thing to do and results will be more gratifying. In regular contests this, of course, is not done.

Exhibits can be held any time before Christmas, or at the close of school. If the school is fortunate enough to have a display window or cabinet, the exhibit should be continuous.

The benefits to be derived may be classified as those beneficial to the instructor, to the students, and to the community.

The instructor will receive many new ideas as to new projects and methods of construction, suggestions as to things done that should not have been done, and hints as to how the work may be made more effective. It will also give him opportunity to compare the work of his pupils, with that of others, where more than one school is involved. In his own contests and exhibits he will have opportunity to see all projects together, and be able to judge the progress of the work during the year. The instructor should always avail himself of these opportunities whenever occasion permits it.

The benefits are equally as great to the student as to the instructor. Contests will cause him to do more studying and thinking in order to make his project better than someone else's, resulting in greater knowledge and understanding of industrial arts. It develops the ability on the part of the student to profit by his loss. The boy may not get first place, but he will have an opportunity to learn why he did not win. Learning wherein his project failed, he can plan his project better for the next contest.

Contests are extremely beneficial to the community in that they foster greater cooperation with the school because parents become more interested in what their children do at school. The oftener parents visit the school the better cooperation there will be. The community gains greater respect for industrial arts when it sees how this work interests the boys, and gives them practical skill at a time in their lives when their interests are hard to hold. The community will have to have its appreciation for good furniture developed. Parents have opportunity to compare their boys' work with that of other boys in the same school, and to compare their school's work with that done in other schools.

HOW IS YOUR DOME?

Laurence Parker, Kansas State Teachers' College, Pittsburg, Kansas

"Out in Colorado is an observatory in which I am much interested," said Bishop McDowell in his talk to Kansas school teachers. He helped to make this observatory possible and watched it in the building.

The dome of this observatory is mounted on ball bearings and turns very easily. A mechanism can be so adjusted that the dome will turn fast enough to enable its telescope to keep up with any chosen star in the heavens.

Bishop McDowell declared that few human domes were on ball bearings. They were fixed and unable or unwilling to make the effort to look at more than one quarter of the truth.

"George Blank" is a manual-training teacher who has his boys do *all* their drawing before they touch a tool to make the projects. He says, too, that boys are more unruly and harder to interest than they used to be. Perhaps his dome is fixed and he cannot see the fact that cold-storage study of drawing is a tasteless diet.

"Henry Perkins" is a manual-training teacher who makes his boys ink in their plates because it makes for neatness and accuracy. How easy do you think Henry's dome revolves?

"Albert Smith" is still allowing his boys to make handsome solid-oak mission furniture. Not so stylish any more but "the tool processes have a high educational value and we have a complete set of designs." Albert's dome, if on ball bearings, may have jumped the track.

"Percival Brown" just can't see why the boys are so crazy over Fords and so reluctant to make the twelve joints. He still believes the only manual-training subject is woodwork. Percival's dome is in low gear, if not fixed.

"Fred Newton" learned all about wood finishing back in '02 and doesn't seem to know that celluloid finishes would solve his old problem of dust in the varnish. His dome hasn't budged an inch since '02.

Of course none of the readers of these pages could be accused of any of these things mentioned here. Your domes are not stationary or fixed but do they move at the proper speed to keep up with the movement in education and in life?

Hunt up the man who reads the new books on shopwork; who attends the association meetings and contributes to the program; who keeps in touch with what shops and drafting rooms out in the business world are doing and with how they do it, and you will find his dome to be rolling on a well-oiled track and up to the minute in its march with progress. His dome is free turning with a view of the whole problem of fitting boys for life by the use of shop and drafting room.

How is your dome?

THE HIDDEN VALUES OF THE TRADE ANALYSIS

J. Douglas Wilson, Los Angeles, California

Vocational training, as related to trades and industries, has now been in successful operation in this country for several years. Many classes are functioning to a high degree of efficiency and the students are beginning to enter their chosen field of industry. In addition, numerous teacher-training classes are being conducted for the training of trade teachers.

One of the required subjects in teacher-training courses is the "job analysis." This subject may really be looked upon as the backbone of the teacher-training work because many of the other subjects are based on it. As an instructor in trade training, and as one who has taken this required teacher training, I have asked myself many times what the value of the trade analysis really is. This article is an attempt to answer that question, and I hope it will provoke some stimulating thoughts.

One of the values of the trade analysis is that it makes the mechanic realize that the job of teaching is one of great importance. It may look easy to an outsider to teach a trade, but after one has made an analysis of his trade, the idea of teaching that trade no longer looks like such an easy job. The mechanic who is analyzing his trade, will soon perceive that it possesses a great mass of teaching material. By the time a trade is divided into blocks, levels, and type jobs, one is quite often astonished to find the quantity of material that has been organized.

Another factor is the ease with which a group of trade terms can be assembled when an English instructor requests such a list. To compile such a group of words after a trade analysis is completed, the instructor needs but to list the words already worked out for each job.

This same principle will work, in a limited way, in at least formulating the mathematics and science pertinent to a trade. Each type of job is analyzed for this material and the composite group makes a splendid outline for a mathematics or science course.

In passing, it might be said that the foregoing is true whether the analysis is made by the Allen method, or the Selvidge method. In either case, these "hidden values" are there.

There is still another value in the work and that is, that the ability to express oneself clearly is much improved after one has gone through the process of actually making an analysis. In other words, the trade instructor's English is bettered by making a trade analysis.

Another hidden value is the development of the ability to "analyze" new situations. A difficulty arises and the instructor must be able quickly to divide it into its several parts in order that he make an intelligent and wise decision. This is true whether the difficulty is a new job to be undertaken, or a discipline case to handle. The man with training in analysis work is, therefore, better fitted to take care of the exigencies which arise in the classroom.

If, therefore, the work of making a trade analysis results in causing a tradesman to realize the teaching content of his trade; provides material for the use of the related-subjects teacher; improves his command of the English language and increases his ability to analyze, then there is no question that these are more than sufficient reasons why the skilled craftsman should be required to make an analysis before entering the teaching profession. No reference has been made to the use of the analysis itself, as that phase of it is more readily seen, but the hidden values enumerated in the foregoing, should be pointed out as they make the drudgery of the work seem really worth while.

BOYS FROM THE VOCATIONAL DIVISION OF THE ROOSEVELT HIGH SCHOOL, MINNEAPOLIS, BUILDING A REAL GARAGE. The cement work was also done by the class as an introduction to real concrete work.

INDUSTRIAL-ARTS MAGAZINE

EDITORS

E. J. Lake *J. J. Metz* *S. J. Vaughn*

GETTING THE REQUISITIONS IN EARLY

The operating expenses of schools exclusive of the salary account are always a minor item in the school budget. While in a large city the accumulated demand is substantial, the items per school or per pupil are comparatively small. The destructive consumption of schools is nil compared to industry.

When the manual-training shops began to set up lists of equipment, conservative school authorities wagged their heads in doubt. Just as soon as the shop suggested a service to industry, then the emotionally philanthropic individuals began to swing to another extreme. The process of adjustment has now been going on for some years. All in all, the vocational budgets are conservative, and for the most part, little cutting is necessary.

But the problem of early requistions is an old problem, and it is always with us. Supervisors call for estimates and the spring months are passed and slow responses come from teachers. One man wants this and another that, but the composite picture is not clear until June. Yet, all the buying ought to be done in May and June, so that deliveries and installations can be made in June and July.

The two-month vacation period is ideal for major changes in shop layouts and equipments. Plans should be matured and accepted early in spring to assure final approval, and the placing of orders. Shipping and installation problems are practical difficulties. They are particularly serious on large items of machine tool or shop equipment which involve production or installation problems of a special character.

Supervisors who have struggled with equipments and disappointments in shipping dates, know that early requistions are a necessity. But the requisition from teachers or principals unfamiliar with trade practice may gum up an entire budget and place a director in an embarrassing position with the superintendent, school board, and the other teachers of the system. To punish such teachers by "no equipment for next year" may not be fair to shops that need at least the standard outfit accepted as minimum for the community.

Right now is the time to emphasize EARLY REQUISITIONS in order to have the assurance that the school can commence with adequate equipment next fall.

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REVISING THE SHOP LAYOUT

The shop teacher has assured the school executive that the student shall receive in the school shop sufficient technic to hold a satisfactory place in the productive life of an industry. He has made no extravagant claims that his students will possess skill, speed, or efficiency. He has simply promised to do the best he can, and that with not infrequently limited shop, and even more limited, school experience.

In the past decade the promotional groups have faded out of all vocational work, and the school shop has settled down to a given job for a given result. The academic philosopher has forgotten his conflict of "phraseology about the motor-minded lad." The junior high school is struggling for acceptance, but the positive vocational demand on all shopwork above the junior high school has revolutionized and set definite standards for all shop training.

Very positively we have been setting most interesting standards in shop layout and equipment. Without recognizing the standard as such, a very healthy conflict of requirements has classified our acceptance of certain minimums. We know what equipment is necesary to train twenty boys in a printshop, a pattern shop, or a machine shop in a senior high school. We may disagree on minor details, but the essentials are now clear, and the teacher or supervisor no longer fears to assert the standard.

The Industrial-Arts and Vocational-Education Edition of *Bruce's Specification Annual* brings into focus the minimum requirements now accepted as necessary for a shop in a given type of school. In time, the greatest service of the *Annual* will be the setting of a positive minimum below which no school may fall and still claim to do a given job. An acceptance of a higher standard must of necessity advance the entire effort to a new level of efficiency.

Shop layouts for a given type of work are never an accident. Tool specifications must always reflect experience, ability to purchase, and horse sense in providing the acceptable. School executives are most friendly to all shop departments, because of the popularity of the shop with the manufacturers and businessmen of the town. Nothing strikes such a responsive chord as the statement of a director, or of a supervisor, that all his school shops have standard equipment, that his shop layouts are up to the standard, and finally that the students are taught to do their shopwork in a manner that is comparable to the standard which industry has set up.

The first edition of the *Specification Annual* has met a most delightful acceptance. Acknowledgments are now reaching our editorial department, indicating a hearty acceptance of the service. If the *Annual* assists in setting positive standards for shop layouts and equipment, it has justified itself in every way. The fact that the *Annual* will visualize to the school executive the positive minimum requirements in hundreds of leading American cities, will clarify the atmosphere on a dozen debatable questions, and focus attention on methods of doing the job rather than the quibble about an appropriation "on a doubtful venture."

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THE CLASSROOM BUDGET

How we all detest budgetmaking. It entails so much of that hateful bookkeeping and detail work which most of us despise. What makes budgetmaking such a bugbear?

Let us analyze briefly what factors enter into the problem of budgetmaking. First of all, there must be a clear conception of what the class is to produce in the coming year. That means that we must have in mind, or better still, on paper, a clear-cut outline of instruction. From this we can determine, either from experience or by making an assumption, the approximate number of each of the projects that will be made, and the amount of waste material that must be allowed for. This waste material may run up surprisingly high, and must be carefully estimated if the teacher wants to be sure of his results. Of course, in schools where the pupil buys his materials directly from local firms, this part of the budget will not trouble the teacher.

Second: At the time of making the budget, the outline of instruction must be carefully studied with a view to probable revision. The good outline of instruction is a living thing. Life means growth, change, motion, activity. A live outline, therefore, is not one that has become a fixed quantity that cannot be changed. When the budget is being made, therefore, one must prevision the changes that will be made in the coming year. That means more assumptions.

Third: The number of students who are to be accommodated must, necessarily, enter into the problem. Is the class to be of the same size as it was during the past year, or is the class size to be changed? If a change is to be made, the budget naturally will be affected. The teacher himself is not

always in a position to determine what these changes will be, and the administration must disclose its plans before the teacher can intelligently handle this important factor in budgetmaking.

Fourth: What will be required in the way of new equipment, or repairs to old equipment? Repairs and maintenance costs are difficult to estimate unless previous costs, accurately kept, give one a basis for a real assumption. In the absence of such a sound basis, however, an assumption must nevertheless be made. It is a matter that must be considered and cannot be lightly evaded. The admonition "be sure you are right, then go ahead" may be very valuable, but in the case of the budget, it is well to remember that you must go ahead whether or not you are sure that you are right.

If a classroom library is part of the shop, the books should be carefully looked over to see how many need to be replaced. Catalogs of new books should also be looked over attentively to see which books should be added. Reference libraries in a worth-while shop also belong to the things that live and grow.

Fifth: In shops that are called upon from time to time to do work for the school or for charitable or other organizations, the budgetmaker should be sure to have a definite understanding that materials used on such jobs are not taken out of the stock that is covered by his budget, or if the material is taken out of stock, proper credit should be given. If this is not done, there will be a sad awakening some day when the budget allowance has been used up before the school year has reached its end.

School administrators should remember that they are not absolved from carefully checking the amounts and quantities found in the various lists just because each teacher hands in a classroom budget. Simply holding the teacher down to a budget which for some reason or other is not adequate, is wrongfully penalizing the student, and discredits the school. In the final analysis, the administration, and not the teacher, is held responsible for the management of the schools.

STANDARDIZATION

Tests, committees, uniform courses of study in cities, threatened Federal control, strict supervision, and the like, are earmarks of the trend for standardization. Efficiency methods of modern industry have taken root and the spreading plant is having a steady growth.

This movement forces us to choose a common meeting ground between individualization and control from above or from authority. To contend that no use should be made of the scientific advances in standardization tests would be as much out of place as to use them entirely to the exclusion of the personality of teachers and students. We must recognize the value of mass evaluation through the use of tests, but must not consider tests as final in individual cases. We must realize that achievement tests are merely a measure of achievement and not a measure of ability to achieve. They measure the child's reaction to his environmental opportunities. When the experiences of the individuals tested are identical, the results of the measurement of achievement will be final. This equity of experiences is not possible, hence the danger of taking standardized tests too seriously in individual cases. The test will point the possible way, and it is then up to the wise teacher to prescribe a possible remedy.

The administrative problem of transfer of students from one school to another often results in standardized courses of study. It is, many times, the return to the old Prussian educational efficiency, where Miss Jones in X community taught the same thing, at the same time, using the same method, as Miss Brown in Y community. There is a danger in insisting on strict standardization when the individuality of the teacher is ignored, or when the student absorbs things imposed from above. However, we still have a few administrators and teachers with these old Prussian ideas. The activities of the students and the personality of the teacher are of so much importance to the learning process, that standardization, if taken too seriously, will be disastrous. The courses of study in different schools should cover the same general character of work over a period of time, but the problems and methods used would necessarily be different, because every class and every teacher differs. Strict standardization has the advantages of economy of time and so-called efficiency, but it is not in accordance with the more modern educational trends.

THE PROFESSIONAL MAGAZINES

There are many teachers who read their professional magazines with great regularity, but never think of contributing any subject matter themselves. They seem to forget that it is their profession as well as the profession of those who contribute. Why should the one help to build up the literature of a given calling, while the other sits idly or passively by? It is, of course, a foregone conclusion that not every member of a profession can be a literary expert. As a matter of fact, many of the ablest men in such professions as medicine and engineering are notoriously poor writers. But the men who render prominent service in any field should, nevertheless, in some way or another make the fruits of their superior intellect available to their less fortunate fellow workers. It is only by this unselfish and vicarious service that the profession will grow.

The teacher who writes for his professional magazine derives a great deal of benefit therefrom over and above the honorarium which he receives for the article. There is, first of all, the feeling that you are assisting your fellow workers, especially the younger teachers who have just entered their chosen field of activity and are anxiously looking about for anything that may help them in their work.

Besides this altruistic satisfaction, there is the personal satisfaction of being a leader who is able to show others how to do something worth while. Then too, as one writes for publication, the facility of this form of self-expression becomes correspondingly easier.

Not the least, however, is the satisfaction that the writer is assisting in writing the history of his profession. The appearance of a name year after year under professional articles stamps the writer as a live member of the profession. It gives him prestige, and casts credit on the institution where he obtained his training, as well as on the educational establishment at which he is engaged.

Incidental Vocational Education

So far as vocational work is concerned, much incidental vocational education exists in the handling of tools. The old type of manual training did not make many carpenters, patternmakers, machinists, or draftsmen, but it did give many a boy a chance to discover his talents, and as far as the tool processes are concerned, it gave many of them a good start in the vocations.—*Lewis Gustafson.*

Trade-Extension Work

The most effective vocational-education work being done today is being done with pupils over 16 years of age. The best form of vocational education is the trade-extension type which takes people already employed in a trade and carries them forward. People who have made up their minds as to what they want to do are those most easily trained.—*F. T. Struck.*

VOCATIONAL GUIDANCE AT PROVIDENCE, RHODE ISLAND

Arthur J. Peel, Brookline, Massachusetts

IT IS CHARACTERISTIC of Rhode Island that it should plow a lone furrow and this is well illustrated in its public-school work. A significant movement which should be of particular interest to students of vocational guidance, is developing in Providence under the supervision of Dr. Richard D. Allen, the assistant superintendent in charge of this branch of the work.

It is of interest to learn that public interest in schools in Providence is sufficiently advanced and articulate to have secured for school purposes, 35 per cent of the total revenue of the city. This appropriation is under the direct and sole control of the school committee of seven members. Under such favorable conditions, of course, much is possible which otherwise could not be attempted. For instance, seven million dollars have just been allocated for junior high schools, and this sum will be spent without let or hindrance from any other legislative or executive body. This explanation is necessary in order to explain the somewhat elaborate machinery which has been created to give practical expression to an ideal which is so high as to arrest attention and enlist the sympathetic interest of teachers, universities, educational authorities, and the public at large.

In order that we may understand the background of the bureau of research and guidance, it may be said that the fundamental argument advanced by the originators of the movement in Providence, is that vocational guidance should begin, not in the high schools, but in the grammar and grade schools; that the need for differentiation in education exists in every individual class. When we find girls of senior-high-school age in the 1st and 2nd grade, it is manifestly a case for special classes, but when we find boys in the 7th grade ranging from 10 to 14, the need for differentiation is just as great, though not so quickly recognized. In other words, if the mean average age for that grade is, say, 11 years, then the 14-year-old boy is in need of some special attention, and the purpose of the bureau is to discover what that boy needs and how best to meet that need. The biggest waste in school-work, according to Dr. Allen, is not in maintenance of buildings, cost of tuition, too elaborate buildings, and so forth, but in educating misfits along wrong lines. Here is a girl in high school; she is taking the usual classical course. She is an exceptional musician but without any special facilities for developing herself in this direction. Her purpose, however, is to become a kindergarten teacher. For four years, she will be learning Latin, Greek, French, and other subjects of the classical course. In what way is this advancing her toward her goal?

These are some of the problems that the bureau of research and guidance is tackling, and on which it is establishing carefully planned procedures and practices in which all teachers are required to cooperate. The practice of devoting a certain specified time in the discussion and study of vocations in high schools, is becoming increasingly popular. Providence has gone further along this line than most cities. For six years prior to graduation from high school, pupils are required to spend four periods a week systematically studying vocational occupations. This means that 7th- and 8th-grade pupils are introduced to the requirements and possibilities of vocational occupations before they go to high school. One section of the bureau is devoted entirely to guidance in grammar and junior high schools, and one of the functions of this branch is to advise as to choice of high school.

It is not the business of the bureau to label this boy a printer and that boy a plumber, that girl a typist, and the other, a teacher. The whole purpose of vocational guidance is to furnish the pupil with the knowledge which will enable him to choose his life's vocation intelligently and wisely. At the same time, of course, the research work of the bureau has provided a fund of information which enables the teacher to direct intelligently and wisely the activities of the pupil along those lines in which he is best fitted, as revealed by scientific tests.

The organization of the bureau of research and guidance as depicted in Figure 1, is clearly defined as to functions, divisions and personnel. Considerable pioneer work is being carried on under administration research, and the chief of

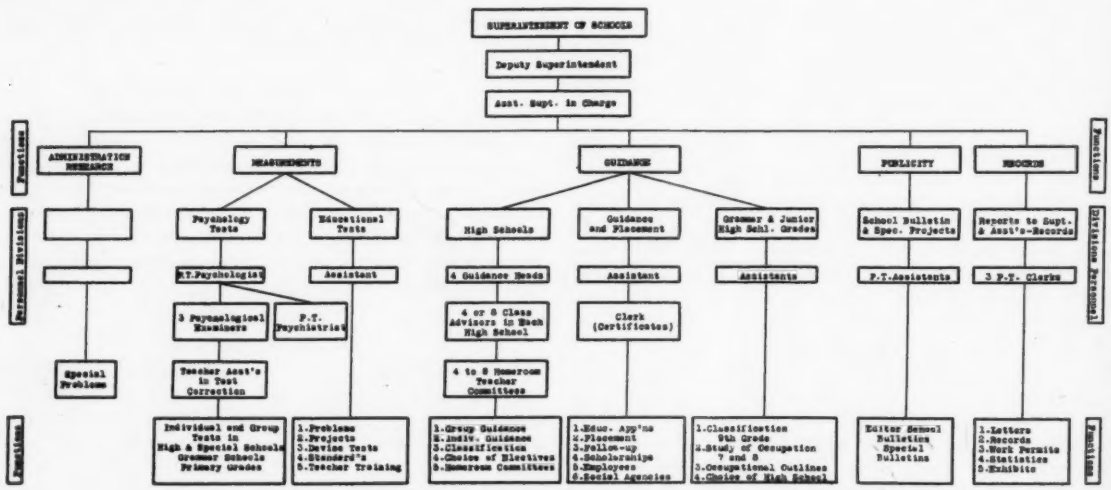
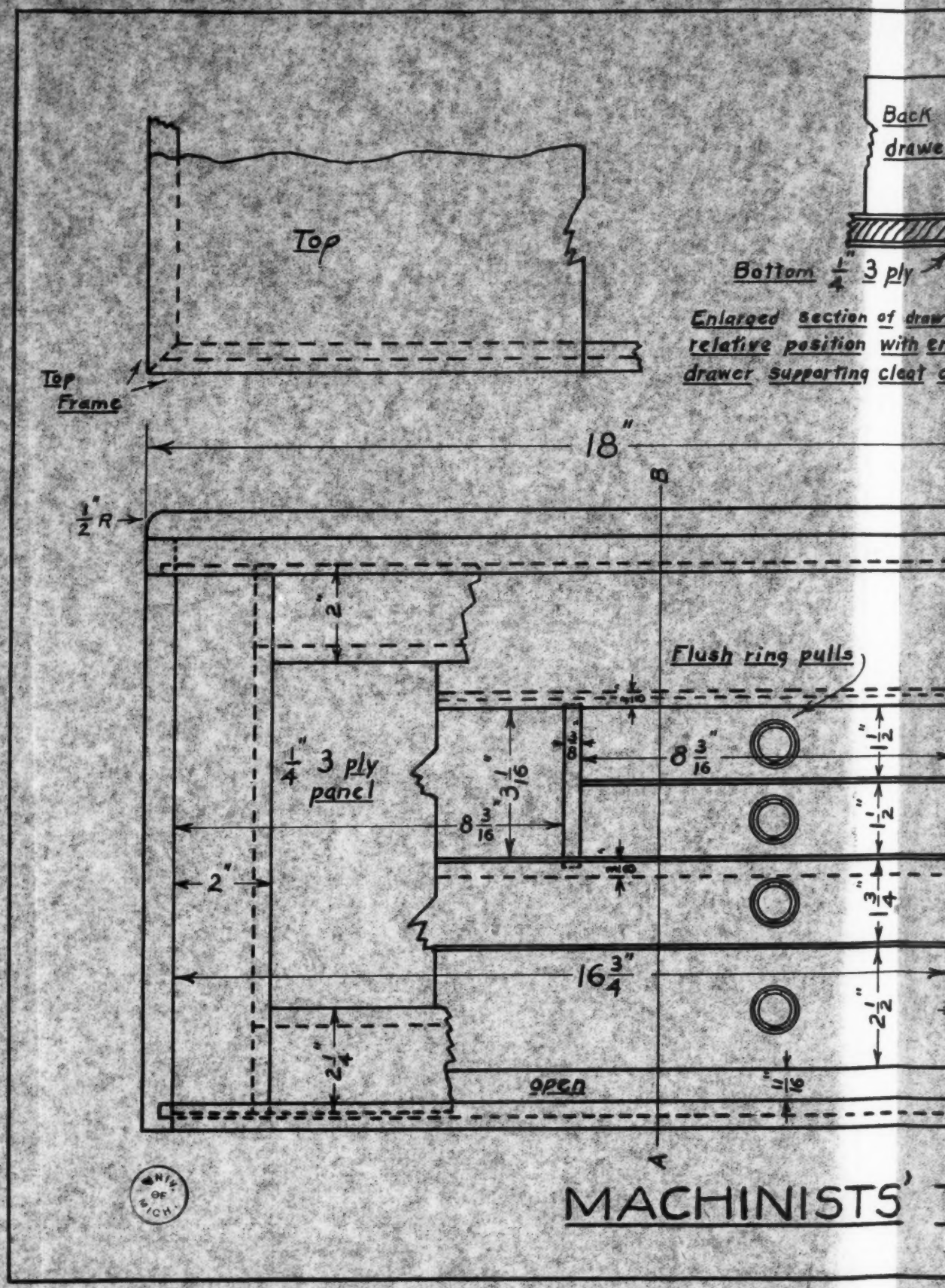


FIG. 1. ORGANIZATION OF THE BUREAU OF RESEARCH AND GUIDANCE, PROVIDENCE, R. I.

TRACING SUPPLEMENT No. 92,
THE INDUSTRIAL-ARTS MAGAZINE,
MAY, 1928



UNIV. OF MICH.

Designed by Jos. J. Lukowitz, Milwaukee, Wis.

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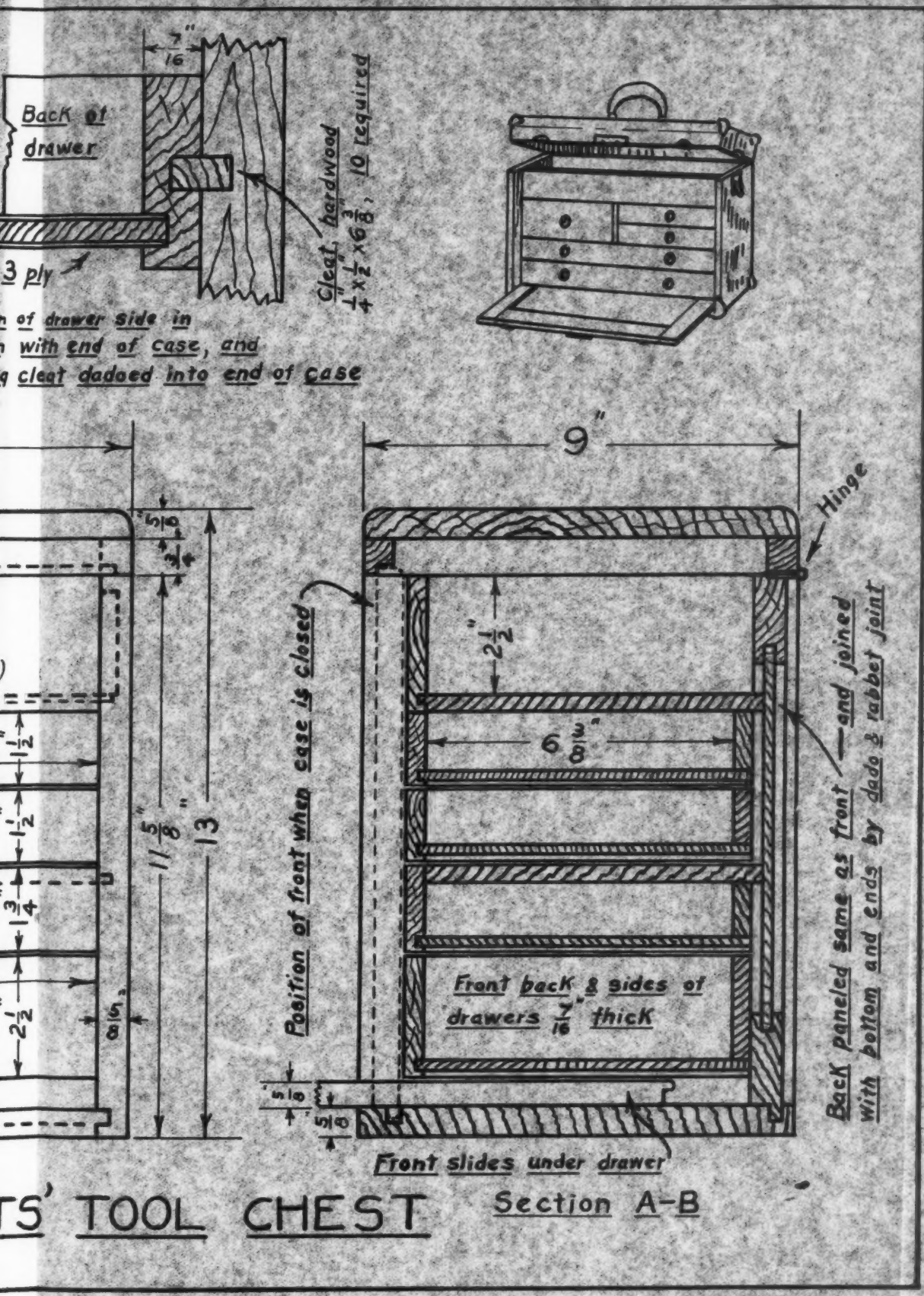
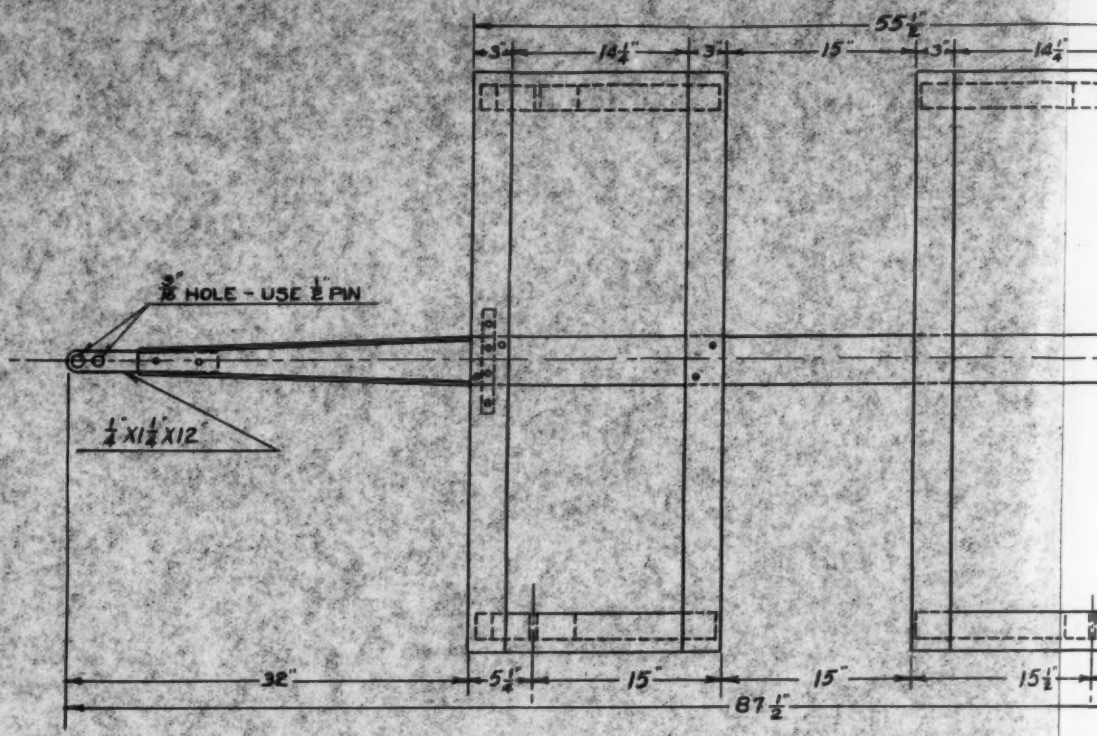
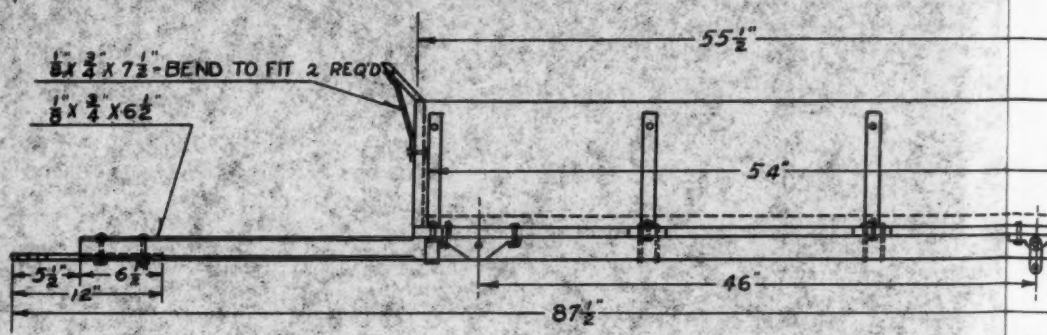


TS' TOOL CHEST

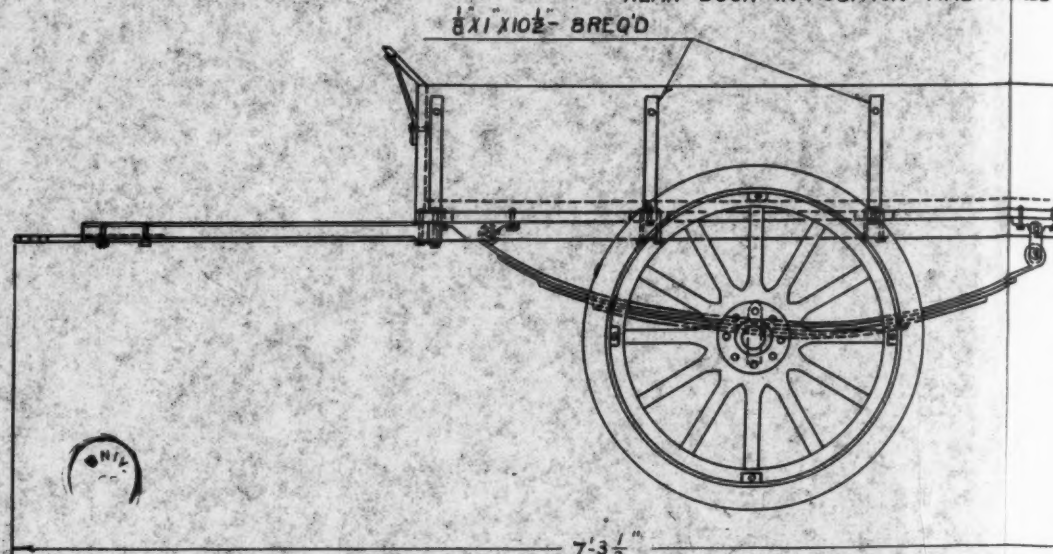
Section A-B

For Details See Page 183, Industrial-Arts Magazine, May, 1928.





REAR DOOR IN POSITION AND OPENED



A LIGHT EFFICIEN

Designed by M. C. Konders, Fond du Lac, Wis.

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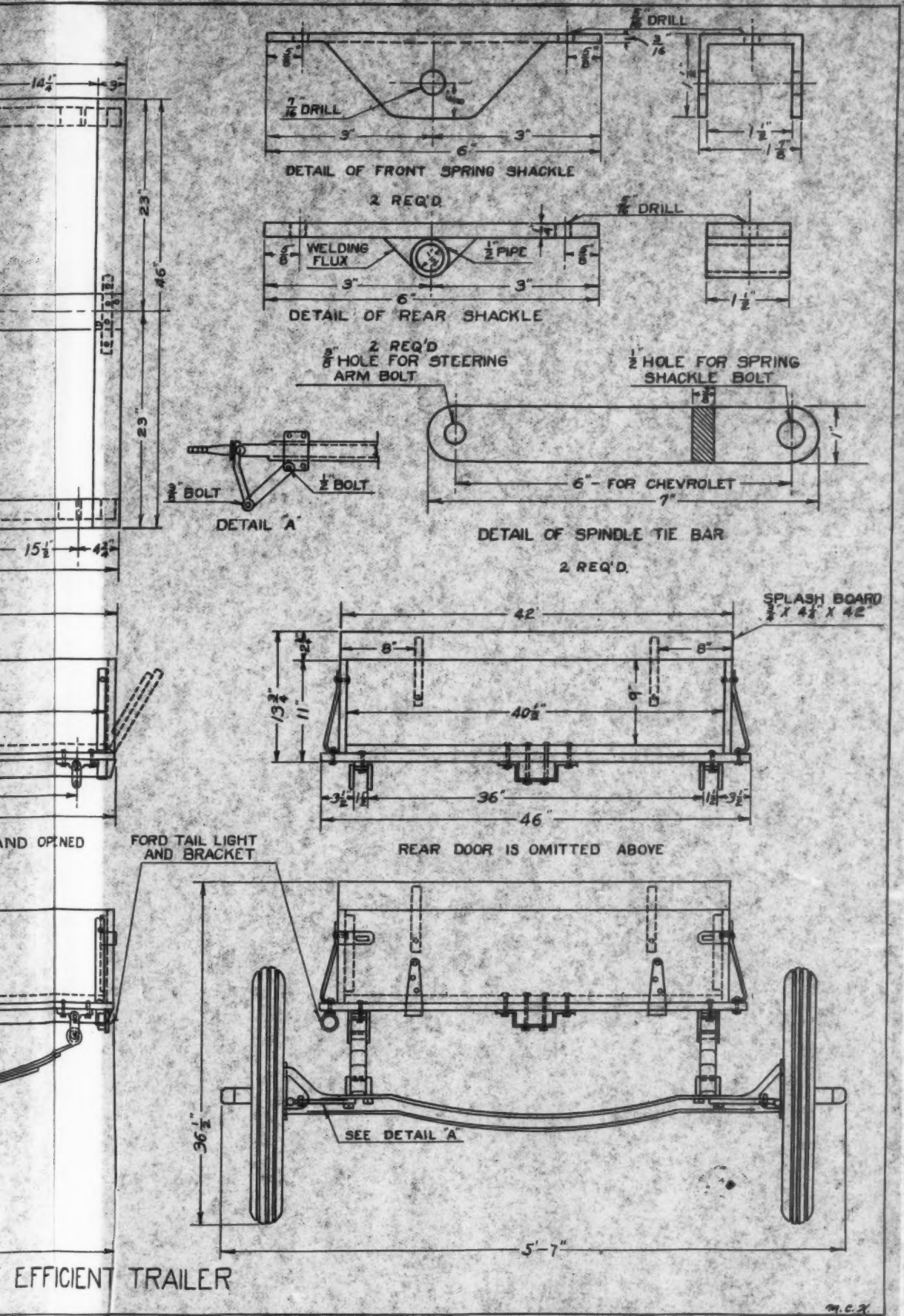


For Description See Page 183, Industrial-Arts Magazine, May, 1928.

the bureau, Dr. Allen, is in constant demand at Harvard, Brown, and other eastern universities, as a result of the intensive work to which he has devoted himself in the interest of vocational and prevocational training in the public schools. The individual and group tests conducted in all schools, and analyzed by trained assistants, are the bases on which is established what might be termed the individual potentiality of pupils. The educational tests provide the data as to the pupil's A. Q. (achievement quotient). By this means the I. Q. and the A. Q. are brought into direct relation in such a manner as to make comparison a simple matter.

On the basis of the results developed under the measurement tests, the problem of group and individual guidance is dealt with under favorable conditions. The fact that there are in Providence over 700 children now in ungraded and special classes, who are being dealt with as special cases, and many of whom are being trained for work in which they are most likely to succeed, is but one indication of the very effective work that is being done by the bureau. At the same time, Dr. Allen admits that they have only just begun to touch the fringe of the subject. It is quite evident, however, that what has been accomplished so far, has definitely established a scientific basis on which to build for the future.

It will be noted that a special publicity branch has been established in the bureau. The chief purpose of this branch is to prepare and issue a quarterly bulletin of some 40 or 50 pages. This publication is devoted to the interests of the public schools, and is largely educative as well as informative. It must be admitted that much of the reading matter, and more particularly the charts and graphs used for illustrative purposes, are beyond the lay reader, but to the teachers and others who are seriously interested in public-school problems, this publication is of the greatest value.

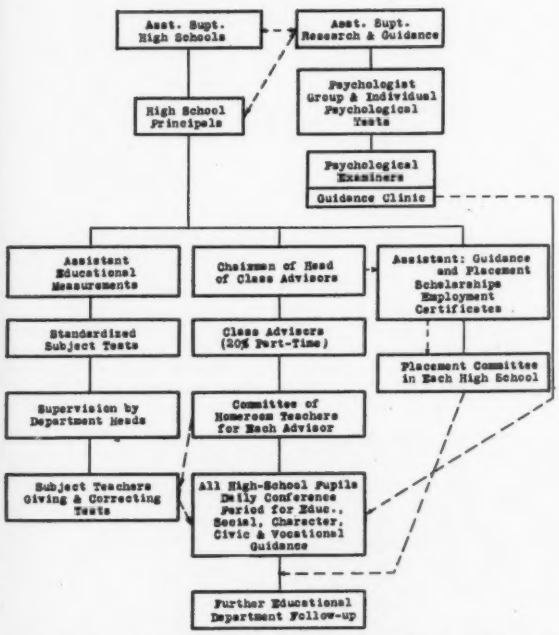

Asst. Supt. High Schools
Asst. Supt. Research & Guidance
Psychologist Group & Individual Psychological Tests
High School Principals
Psychological Examiners
Guidance Clinic
Assistant Educational Measurements
Chairman of Head of Class Advisors
Assistant: Guidance and Placement Scholarships Employment Certificates
Standardized Subject Tests
Class Advisors (20% Part-Time)
Placement Committee in Each High School
Supervision by Department Heads
Committee of Homeroom Teachers for Each Advisor
Subject Teachers Giving & Correcting Tests
All High-School Pupils Daily Conference Period for Educ., Social, Character, Civic & Vocational Guidance
Further Educational Department Follow-up

FIG. 2. THE ORGANIZATION OF GUIDANCE IN THE PROVIDENCE HIGH SCHOOLS.

At the time of writing, Providence has no junior high school, but a program is now under way which provides for the building of seven junior high schools immediately. On the completion of these schools they will be organized in the same way as are the present high schools, the organization chart of which is shown in Figure 2. Contrary to the general system found in most high schools, where one or two teachers or other individuals are designated as vocational advisers with separate offices, and who are rather more than less independent of the classroom atmosphere, the Providence high schools have a staff of 22 vocational advisers, all of whom are in close touch with students. It will be observed by a study of this second chart, that the close relationship between the actual tests given by the assistant of educational measurements in the high schools, and the I. Q. charts and tests prepared by the psychological examiners in the research and guidance bureau, is well established in the high schools of Providence. The result of the former is checked by the findings of the latter; the A. Q. tests show where the pupil actually stands, the I. Q. tests show where he ought to stand. The pupil is constantly under a dual test, for his progressive achievement is scientifically checked with previous accomplishment, and with group standards, and, we might add, with chronological standards.

It is significant that in Providence, employers of labor prefer commercial high-school graduates to private-commercial-school graduates. Due to the emphasis that is placed on vocational guidance, and the practical steps that have been taken to steer pupils away from courses and subjects for which they are manifestly unfitted, and wisely direct them to those subjects which will help them toward occupations for which they seem better fitted, the percentage of "failures" among graduates has been very materially reduced. For instance, out of 147 graduates of the June, 1926, class of the commercial high school, 107 are employed, and only 15 failed to find permanent employment. The remainder are accounted for by those who elected to continue their formal education, who left the city, or who are staying at home from choice. The median weekly wage for the boys employed is $15.08, and for the girls, $14.65. Of the 114 students who graduated from the classical high school, only 7 are not pursuing full-time courses in schools and colleges, the largest number having entered Brown University.

Vocational guidance does not end with graduation from high school, however. A good follow-up system will indicate where past students are in need of assistance because they have failed to find work suited to their interests and abilities. This may mean further need for guidance in enabling the boy or girl to adjust himself or herself to work after they have left school.

A FEW DO'S FOR THE MANUAL-TRAINING TEACHER

C. M. Gilmore, Director Manual Arts, Hazard High School, Hazard, Kentucky

1. Invest liberally in books and magazines pertaining to your work. They will promote your efficiency and help keep you out of the rut.

2. Pay strict attention to your physical fitness. It will help you to avoid nervousness, irritability, and melancholy if you keep yourself in good physical trim.

3. Roll up your sleeves and make a few model projects for your boys. It will help you to sympathize with them in the making of their projects. It will also set a good example for them.

4. Keep a well-arranged and well-kept shop. It is not only a mighty effective silent teacher, but it also facilitates and makes working pleasant.

5. Strive to make your work more effective and more interesting. Garner fresh and interesting ideas and introduce them into your shop.

6. Encourage your boys to offer you suggestions and ideas for new projects, for additional shop equipment, for better shop arrangement. Obviously, this will increase their interest in the school shop.

PROBLEMS & PROJECTS

This department aims to present a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine-shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration.

THE SENIOR CLASS GIFT

Leon H. Baxter, Western Reserve Academy, Hudson, Ohio

In seeking for something original, as a memorial of the class of 1926 at Western Reserve Academy, the boys in the class considered that they would get more satisfaction out of building their memorial than out of buying it. Accordingly, it was unanimously decided to construct the concrete garden furniture and approach shown in Figures 1 and 2.

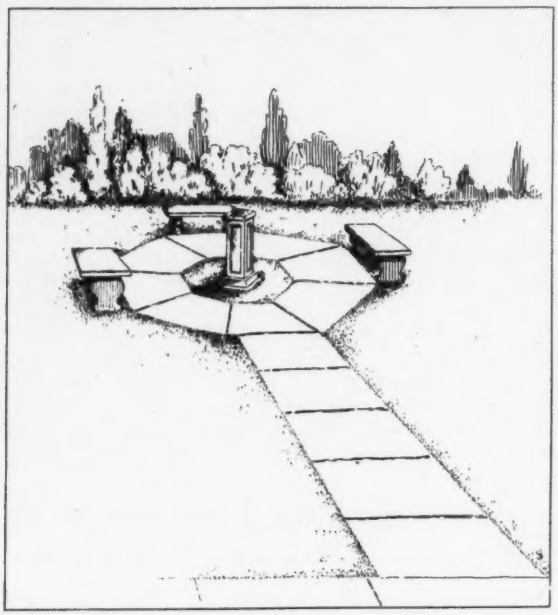


FIG. 1.

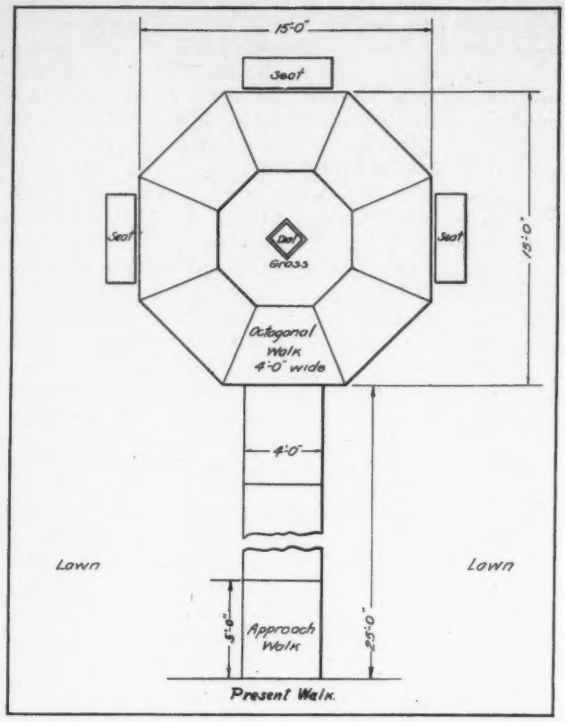


FIG. 2.

As instructor in charge of manual arts, I decided to correlate this work with as many other school departments as possible.

Layout plans and designs were discussed, drawn and blue-printed in the drafting department, and from these drawings the wooden forms for the seats and sun dial pedestal were started, each boy being assigned to definite part as his share in the work. This gave excellent practice in laying out, cutting to dimension and final finishing of the various units.

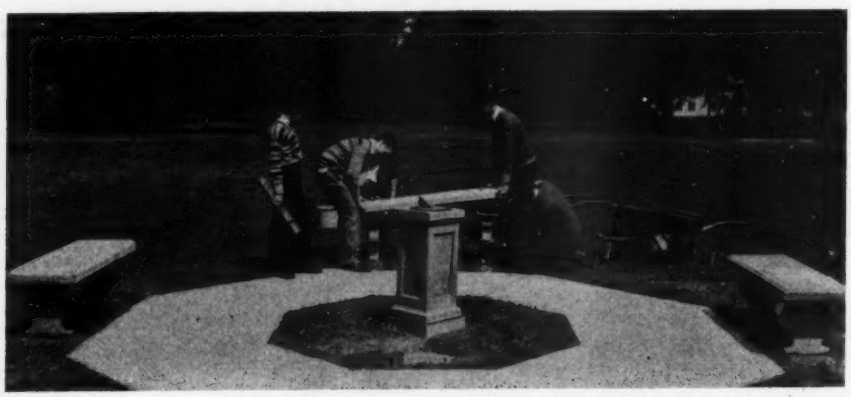
The need for careful surface finishing, and subsequent oiling of the form interiors was demonstrated, so that a smooth surface on the casting would be obtained.

It was carefully explained that the forms should be put together with screws, rather than nails, in order that they could be removed easily from the green concrete.

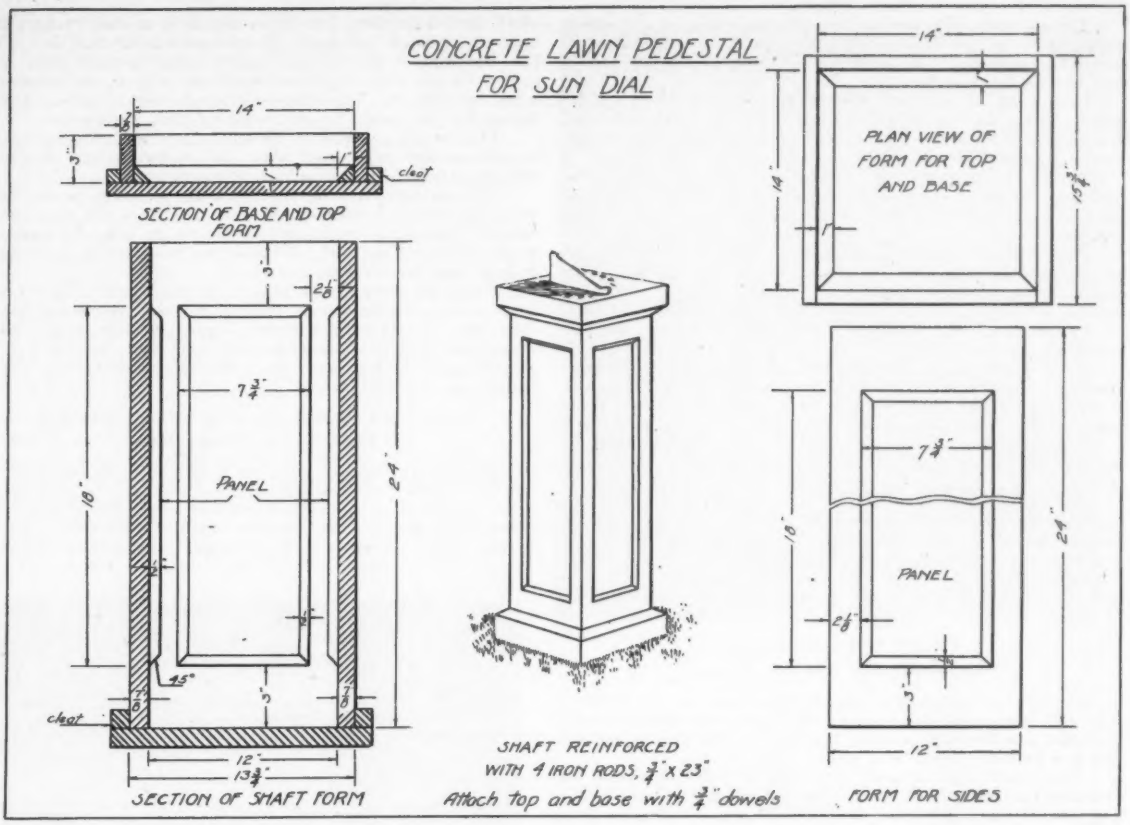
The chemistry department took up the study of cement manufacture in detail. Sketches were made of the method of burning the ingredients in the kiln, and the various steps in turning the raw material into a finished product were carefully explained.

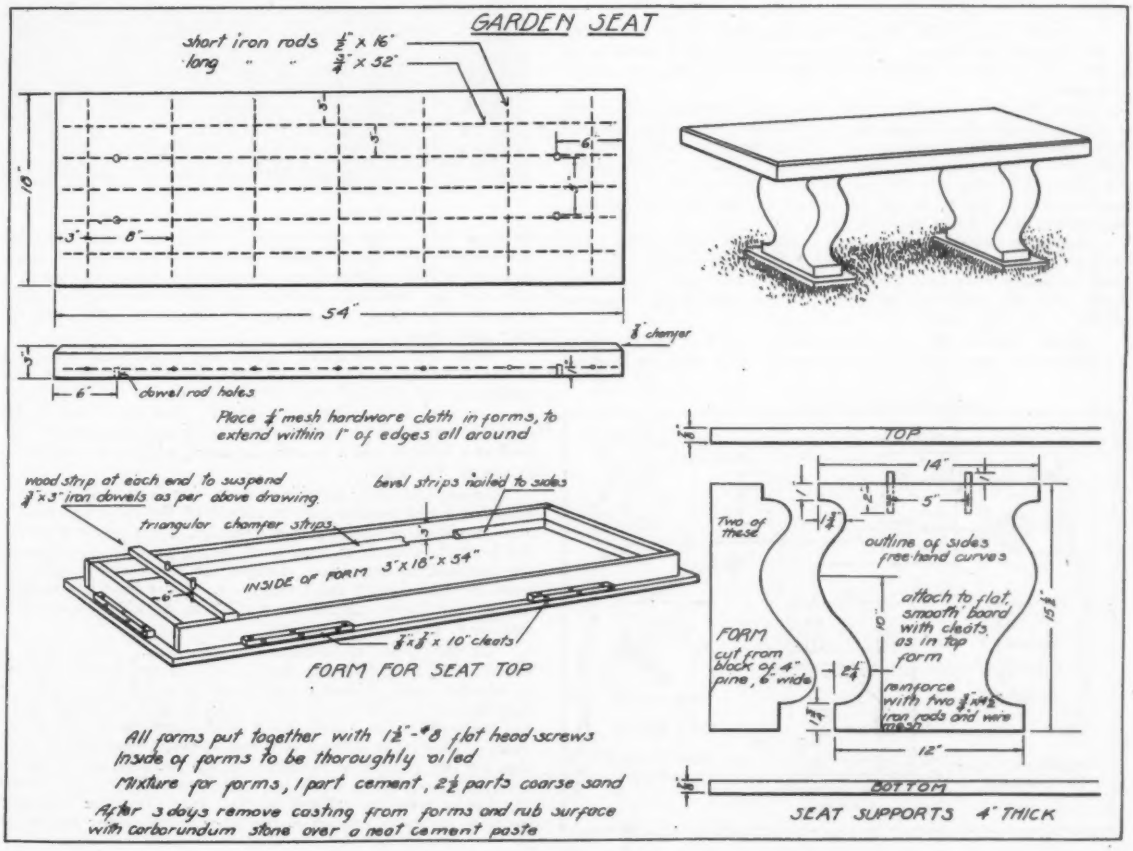
From the standpoint of science it was shown why it is necessary to reinforce concrete under bending pressure, and various types of reinforcement were discussed.

After thorough instruction the concrete was mixed, reinforced, and laid in the forms and left to harden.



PLACING THE LAST SEAT.




GARDEN SEAT
short iron rods 1/2" x 16"
long " " 3/4" x 52"
54"
dowel rod holes
Place 1/4" mesh hardware cloth in forms, to extend within 1" of edges all around
wood strip at each end to suspend 3/4" x 3" iron dowels as per above drawing
bevel strips nailed to sides
triangular chamfer strips
INSIDE OF FORM 3" x 16" x 54"
FORM FOR SEAT TOP
All forms put together with 1 1/2"-#8 flat head screws
Inside of forms to be thoroughly oiled
Mixture for forms, 1 part cement, 2 1/2 parts coarse sand
After 3 days remove casting from forms and rub surface with carborundum stone over a neat cement paste
TOP
Two of these
outline of sides free hand curves
attach to flat smooth board with cleats, as in top form
FORM cut from block of 4" pine, 6" wide
reinforce with two 3/8" x 1/4" iron rods and wire mesh
BOTTOM
SEAT SUPPORTS 4" THICK

FORMS FOR SUN-DIAL PEDESTAL AND GARDEN SEAT.

The approach walk was laid out at right angles to an existing walk, and the octagonal center was plotted by the method learned in constructive geometry. The angle cuts for the octangular walk forms were likewise determined.

Later when the metal dial was attached to the pedestal top, the gnomon of the dial was set by determining the true north and south line by means of a surveyor's transit, using the agonic declination from the magnetic north.

As the work progressed talks were given on the history of cement, from its early use in the queen's chamber in the Great Pyramid, to the present time. Thus, history was vitalized by this piece of manual-arts work.

One square of the walk was laid by the instructor, with the assistance of the boys, from the placing of the slag sub-base to the final finishing of the top coat. From this point the work was handled entirely by the boys, each in turn acting as foreman.

Explanation was given also regarding protecting the fresh concrete from sun and rain.

After completing the laying of the walk the forms were removed from the seats and pedestal, and a demonstration given in the method of finishing the units by rubbing with a carborundum stone over a paste of neat cement and water.

This problem was particularly satisfactory because it correlated the work of the drafting, science, history, and mathematics departments.

But more important than this, from the viewpoint of the class, instead of donating a certain amount of money toward buying a commercial product for a memorial gift, the boys designed, constructed and finished a lasting memorial of their class by their own handwork. The gift therefore contained a part of themselves, and thus became something of which the boy, the school, and the parent could justly be proud.

UTILITY TEST BOARD

Victor Rimsha, Chicago, Illinois

In every electrical school shop there is need for a test board. This test board must be complete, strong and convenient. Usually the board is a flimsy thing which, after a few tests becomes loosened and is a handicap instead of a help.

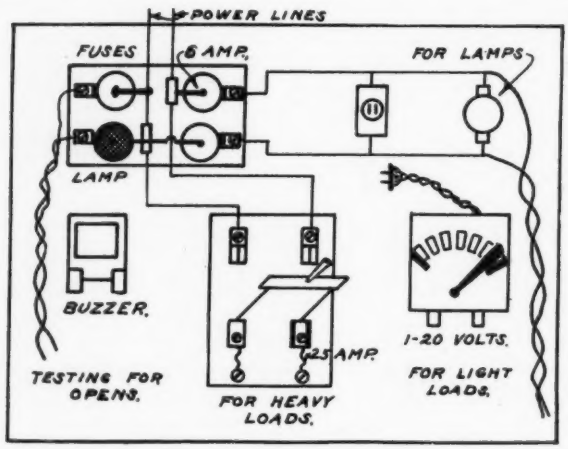
After much experimenting with different kinds of boards the following was adopted. It has all the required units mounted on a single board, which is fastened to a wall, and is out of the way when not in use. It can be made from parts lying around in every shop, and its erection and assembly is a practical problem for the electrical students.

A board 24 by 30 in. is secured and mounted on the wall where it will be most convenient. The arrangement of the different units is not very important, but the board shown herewith has been found very helpful.

One side of the double cut-out fuse block contains a lamp and a fuse. This is used for testing open circuits. The other side has two fuses of 6-amp. capacity, and is used for light loads requiring 110 volts. This side of the block may also be used to teach testing for blown fuses with test lamp or fingers. The two fuses should be unscrewed when not in use so that a fuse will not be blown by accidently touching the two leads together.

Below the fuse block is mounted a safety "D" type entrance box with a double-pole single-throw switch and cartridge fuses. This is used for heavier work, and should be equipped with heavy 20-25 amp. fuses. No test leads are used on this, the load being connected dirctly to the fuse block.

To the right of the box is a transformer. It is of the step-down variable-voltage type. One from an electric train may be used on which the voltages from 1 to 20 are secured by moving a handle over taps. An ordinary bell-ringing transformer may be used, but it has been found that it does not draw enough current for some work. The current for the primary of the transformer is from the convenience outlet just above it. This same outlet can be used for other electrical devices such as electric flatirons, soldering irons, heaters, etc.



The use of a buzzer is optional. It is used for testing the strength of dry cells, short circuits in condensors, etc. Fahnstock clips are attached for ease of making connections.

The test leads from the fuse block are of flexible twisted lamp-cord with wooden handles on the ends. A heavy wire or a nail is inserted through the handle and extends out an inch; the other end is soldered to the test lead. There should be two holes in the board to hold these handles when not in use.

The socket above the buzzer is for testing lamps. It is a regular single socket with the threads flattened out and expanded so that a lamp may be inserted and pressed against the side of the socket without the trouble of screwing in or out. The convenience outlet and this socket are both connected to the fuses on the right so that no outside fuses can be blown.

FOUNDRY WORK IN THE HIGH SCHOOL

Claus S. Asp, Tulsa, Okla.

The modern trend in education is toward the utilization of the inherent aptitudes and interests of the pupils. It also aims to give them experiences in as many occupations as possible in order that they may be better equipped to cope with the problems of life when leaving school. It was with that thought in mind that a corner in

the forge shop in the industrial-arts building of Central High School was equipped with some simple foundry tools and supplies that were necessary in the molding of small projects in the softer metals. The tools that are absolutely essential for such work are few and less expensive than those needed for any other shop activity of similar scope and value.

With only a few flasks, riddles, and small hand foundry tools to start with, the equipment was soon augmented by the addition of molding sand—red clay sand of suitable texture which is found in abundance in this locality. For parting sand, fine beach sand, or coal dust was used. An old shell, a relic of war days, was cut off and used as a ladle in which to melt the metal, while it was being heated in one of the forges.

Among the many suitable projects that have proved to be successful and very popular may be mentioned the following: book ends, small anvils to be used for paper weights, Tulsa signs to be put on the front of automobiles, corn-bread baking pans, bases and top parts for candlesticks, nutcrackers, handles for screw drivers and knives, bases for table lamps, and frying pans. These projects, however, do not by any means exhaust the possibilities of what can be done in this kind of work.

Of this group of projects the screw driver serves as a tie-up between forging and foundry work. It is so used because the pattern is rounded, hence is comparatively easy to withdraw from the mold. The shank for it is forged from $\frac{7}{16}$-in. octagon tool steel, hardened and tempered. The handle which is of aluminum is molded on the shank. Thus, it is made a very sturdy, easily handled tool, and one that any boy is proud of having in his tool kit. In forming the mold, a dummy screw-driver shank is put end to end with the pattern for the handle after the roll-over of the drag. Thus, an impression is made in the mold into which the screw driver proper can be placed

in the right relation to the handle. The split pattern which is used for this handle was first formed on the lathe; then a certain portion of the sides was cut away to make it lighter and of such form as would enable one to secure a very firm grip on it.

The hand nutcracker was designed to be used at the dining room table or around the fireplace for the cracking of pecans, a nut which abounds in this locality. Pecans are such that in cracking them they must be put endwise in the nutcracker, hence, the ordinary variety on the market are unsuitable for use. Then, too, those made specially for the pecans, are made to be fastened to a table top and, consequently, cannot be used in the dining room. The pattern for the nutcracker was formed as shown in the diagram with the special thought in mind of making it light and strong. One side of the concave part of the handle was partly filled with melted wax, and the letters "COZY NUT-CRACKER" were carved in it. Thus the boys also gained information about the making of such novelty features. The mechanical design of the nutcracker included a slip joint like that on ordinary pliers, two cup-shaped holes of different depth in each jaw to enable one to crack nuts of different sizes, and also a setscrew, easily adjusted, to serve as a stop and thus prevent the nuts from being crushed.

Candlesticks and table lamps also have proved practical projects for this kind of general shopwork for the reason that in employing both foundry and forge work in their construction a more pleasing appearance of the finished product is secured.

The molding of projects of the nature herein described has proved very popular and fascinating to the boys. This perhaps, because of the fact that through this kind of work they have been enabled to feel their power in terms of successful accomplishment. Then, too, it has given them an opportunity to gain a rudimentary knowledge of the designing and the making of patterns, the forming of molds, and the melting of metals.

FIG. 1.

PRINTSHOP WORK CABINET

Chester A. Lyle, Instructor of Printing, McKinley High School, Canton, Ohio

The task of caring for the work of each individual pupil in the printshop so that it may not be molested in any way by members of other classes, is a source of much worry to all instructors.

To overcome this difficulty, the cabinet shown in Figure 1 was built under the direction of Mr. Harry D. Palmer, instructor of millwork, McKinley High School, Canton, Ohio. The cabinet is composed of five sections. Each section contains twenty drawers (Fig. 2). These can be safeguarded by locking the door which is provided with a cylinder lock. There is sufficient space between the door and the drawers to allow the drawer to be fitted with a label-holding drawer pull, in which the name of the pupil using that particular drawer is inserted. Three cleats *c* are glued and nailed in place. These cleats have previously had gains cut, into which the cleats *d* are glued and nailed. The drawers have saw gains cut in the side, slightly larger than the dimensions of the cleats just applied. This allows the drawers to be opened and closed freely. A drawer is shown in place at *c*, e^1, e^2, Figure 2. The crown molding and the base molding may vary to suit the architecture of the building. The following is a list of materials with the approximate cost of the same.

101 ft. plain oak	
155 ft. ¼-in. 3-ply veneer	
277 ft. basswood	
Lumber	$ 58.00
Hardware	5.00
Labor	178.35
Total cost	$241.35

In Figure 2 are given sufficient dimensions to guide the shopman in working out the detailed design for milling out the cabinet.

In connection with the printshop work cabinet, it is necessary that an assignment work blank (Form A.) be used.

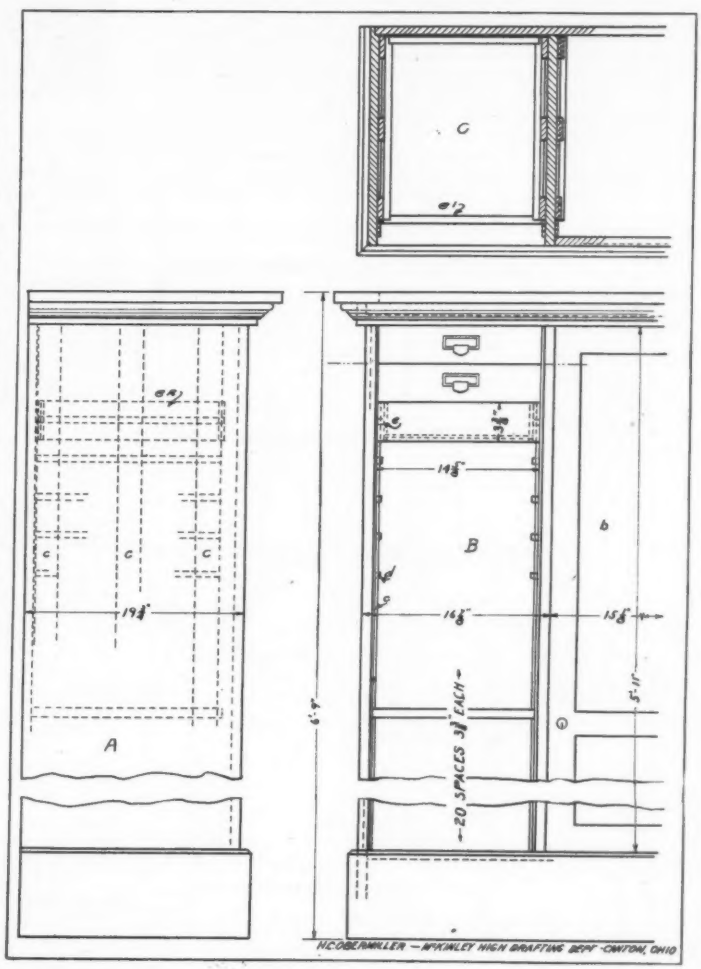


FIG. 2.

McKinley High School Printshop
Canton, Ohio
Date.....
Name of Pupil.....
Class.....Section.....Period.....Drawer No.....
Assignment of Work.....
.....
.....
.....
.....
.....
Instructor

Original of Form A measures 3 by 5 in.

By using the assignment slip the instructor is assured that each student has work when he comes to class. The blank should be filled in completely, in order to avoid any possibility of another student receiving the wrong assignment blank. However, with each drawer numbered, and class, section, and period being noted on the name labels, few mistakes should be made. All assignment blanks should be returned to the instructor upon completion of each job, at which time another assignment is then issued.

Assignment blanks do not take the place of lesson sheets but are an aid to an orderly arrangement in using the printshop work cabinet. They help in systematizing the work of the school printshop.

WROUGHT-IRON END TABLE

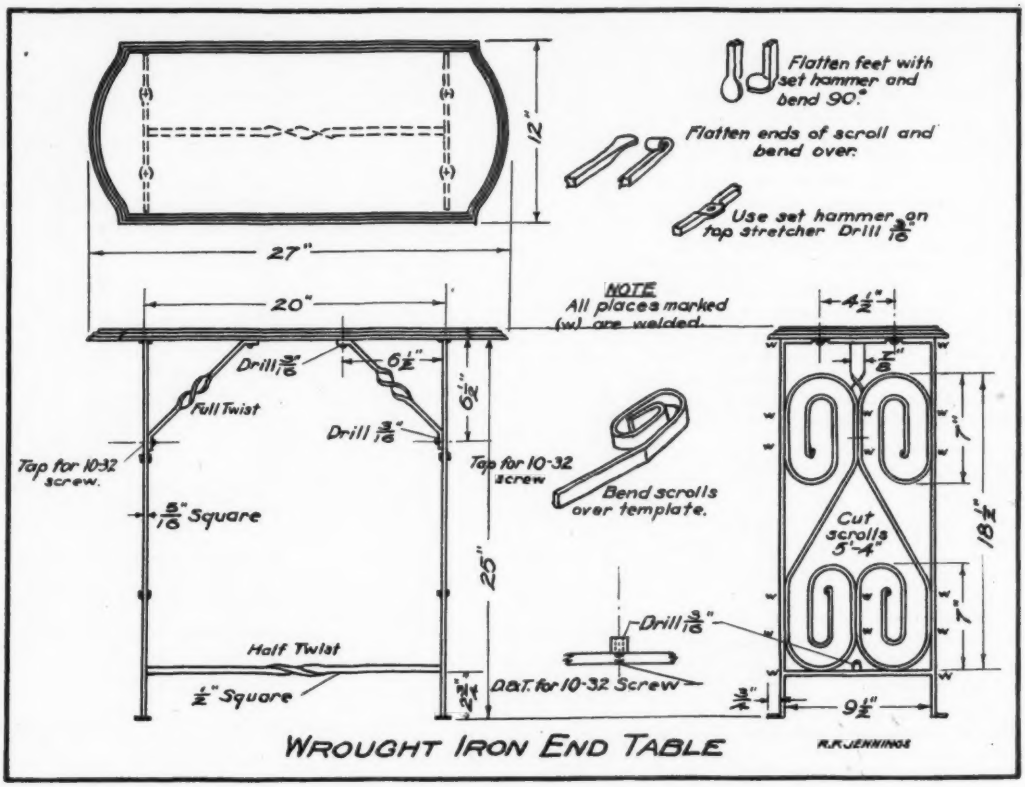
Royal F. Jennings, South High School, Minneapolis, Minnesota

The wrought-iron end table described here was designed to meet the problem of making a worth-while project in the short time of a ten-weeks course in forging.

After making three problems involving the fundamental operations of forging (drawing-out, bending, twisting, upsetting, etc.), the five best workers in the class of twenty boys were shown by demonstration how the parts of the table were made. Then the class was shown a finished wrought-iron table and told that they would have a chance to employ the factory method in making 26 tables like it.

The five selected boys were made gang bosses and each given four helpers. Material was cut and soon the forge shop was a place of great activity. Jigs and templates were used wherever possible to speed production and make all parts interchangeable. Tolerance limits were placed on all measurements. Each boy specialized on some operation and became skillful at it. One group of boys made over 300 welds with acetylene welding equipment. The gang bosses

WELDING THE WROUGHT-IRON PARTS FOR THE END TABLE.



kept their groups supplied with material and helped the slower boys over the "rough spots." They accepted their work as valuable foremanship training and worked for cooperation in their groups and for maximum production. The leaders worked on the job themselves when not otherwise engaged. The piles of duplicate parts grew daily. In fifteen school days, 390 parts had been made and assembled into 26 finished wrought-iron tables.

The woodworking department finished the walnut tops with four coats of rubbed varnish.

The ironwork was finished with brushing lacquers and bronze powders in several polychrome combinations selected by the boys. Each boy lacquered and assembled his own table.

When the last table was finished there was still enough of the ten-week term left for more small exercises and this time was used in simple toolmaking and heat-treatment work.

The advantage of a production job such as the wrought-iron table lies in the construction of an article for each boy, regardless of his ability, that he could not possibly make alone in the same time. The product, however, is not the most important. The most vital part of this problem, for the student, is the sampling of group cooperation and quantity production that is encountered everywhere in modern industrial plants.

ART AND MANUAL TRAINING—LAMP STANDARDS AND SHADES

C. Anthony Van Kammen, Grand Rapids, Michigan

One of the greatest faults of the average manual-training-shop product is that it lacks the elements of good design. The work is massive and clumsy rather than light and graceful. Making the problems stronger and heavier than necessary involves extra material and effort, and these are important factors and should not be overlooked.

The process of designing includes three factors which must be considered. The first is structural design, which is the most important. The second, contour enrichment, and the third, surface decoration. Every object need not pass through all the steps enumerated, but each truly serviceable thing will have passed through the first stage of development. The particular use to which an object is to be put, places certain restrictions upon the dimensions with reference to height, length, and width. A lamp shade for instance, should extend sufficiently to spread the light, yet it must also concentrate it. Though the shade is usually very light, yet it appears to have weight because of its mass. This means that the lamp shaft should appear strong enough to support that seeming weight. Each problem offers opportunity for the study of measure harmony, or, in other words, a chance to work out good proportions. The different space divisions must be so related to each other that unity will result. In connection with structural design, the appropriateness of materials to be used must be considered.

The second step in the progress of evolving an artistic object suggests contour or outline enrichment. The purpose in changing the contour is to give grace and apparent lightness to an object, to make it beautiful as well as useful. Care should be exercised not to sacrifice structural design for contour enrichment. Avoid much use of the compass circle whenever curved surfaces are desired and use the more graceful infinite curve which is ever changing in direction. The infinite curve is sometimes called the curve of force and is the dominant curve in nature. It is evident in the quivering reeds, grasses, ferns, and sea shells. Endeavor to obtain variety by the combination of curved and straight lines, but do not lose unity for the sake of variety. The latter produces overdecoration or extravagant modeling.

The third step in the evolution of an object is the decoration or enrichment of the surfaces. This work requires a knowledge of the principles of design, rhythm, balance, and harmony with reference to tone, measure and shape. This information and experience and its use is to be gained in the art department. With reference to the lamps, the base, the shaft, and the shade all offer surfaces to be decorated, and are given as practical problems in applied design. Much help can be obtained from the art department where similar problems may be worked out and the design applied in the shop.

The lamp standard shown in Figure 1, is a very satisfactory 7th or 8th grade project. It offers a variety of possibilities. The shaft may be modified in many ways. The corners may be stop chamfered, panels $\frac{1}{16}$ in. thick can be glued to the surfaces, or the surfaces may be carved or inlayed. Beautiful two-tone and color effects can be produced with the natural wood and stains. Figures A, B, C, D, E, and F, show suggested designs suitable for the methods of decoration used.

Bill of Material

1 pc.	Walnut or gumwood	⅞x6 x6	Base
1 pc.	Walnut or gumwood	1½x1½x6½	Shaft
1 pc.	Walnut or gumwood	¼x ¼x12	Base Molding
1 pc.	Walnut or gumwood	⅜x1¾x1¾	Capital, or Top
1 pc.	Green or brown felt	6 x6	For Base

Plane the base first, following the rules for squaring up stock. If there is no wind in the board, it need not be necessary to plane the faces, but the edges should be planed square with a face and true to dimensions. Divide two adjacent sides into 2-in. divisions and draw lines across the face both ways. A 2-in. square is formed in the center and the chamfer is to slant from the sides of this square to a pencil line gauged around the piece ¼ in. from the bottom face. Set the piece of wood in the vise at an angle, with one end up, the slanting line on the side of the board parallel with the edge of the vise; that is, in a horizontal position. (See Fig. 2.) This will permit the worker to hold his plane in the usual upright position and make the work easier. Do not plane directly across the grain but diagonally.

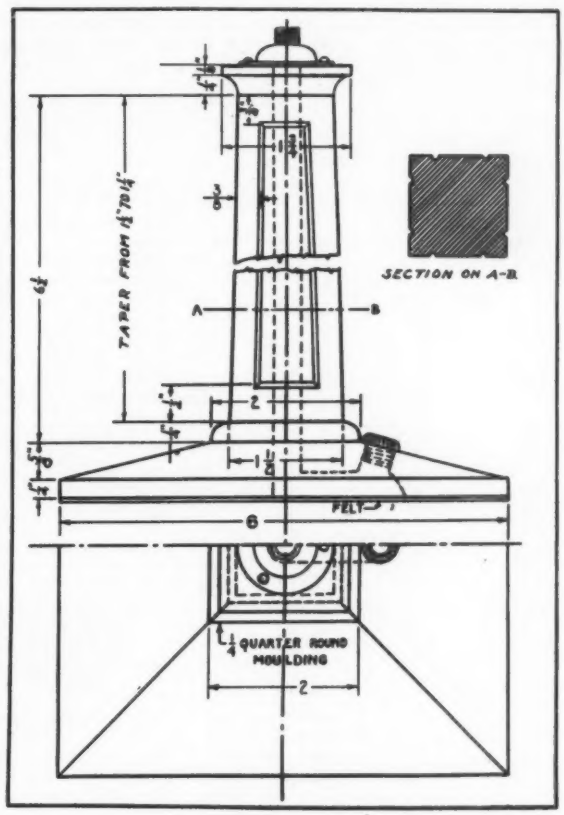


FIG. 1. ELECTRIC LAMP BASE.

The second end is planed in the same way. Next draw lines from the corners of the center 2-in. square to the outside corners of the piece and plane the other two chamfered sides, planing with the grain. Be very careful not to remove any of the 2-in. square in the center of the block. Bore a hole through the center as shown in the drawing, also the outlet for the lamp cord using a No. 6 auger bit. Gouge out the section between the holes as indicated.

Before tapering the shaft make it 1½ in. square and saw off to exact length in the miter box. This will insure having the shaft stand straight on the base. Bore the ⅜-in. hole through the shaft before putting much work on it as the hole is sometimes bored through the side, spoiling the piece. Fasten the two parts together with two 1½-in. No. 6 f.h. screws. The top is nailed to the shaft with brads. The ¼-in. quarter-round molding is easily planed in a jig. A ⅞ by 2 by 12-in. piece of wood, with one edge rabbetted to receive the ¼-in. square stock, is held in a hand screw which in turn is gripped in a vise so that the jig is held at an angle of 45 deg., with the rabbetted edge up. A stop block or nail is placed in the farther end so the ¼-in. piece will not push out. The molding piece will lie snugly in the V-shaped groove and can be planed round as easily as if it were an arris of the jig. (See Fig. 3.) Sand smooth, miter, and glue in place.

The standard is now ready for the surface enrichment and finish. Space will not permit of detailed methods and descriptions of each type of decoration. The duo-tone effects are made by tracing the design in pencil. Then if the natural wood is to show, the parts are covered with shellac. If colors are desired, the parts are stained and when dry are shellacked. The pencil line will help isolate the parts, but care must be taken to use the colors sparingly and not too wet or they will run outside the pattern with the grain of the wood. When all portions of the design are covered and the shellac is dry, the standard may be stained, shellacked and varnished as desired. Do not use too great contrasts. For example, do not inlay a very white wood in a dark walnut piece. The inlay should seem to be a part of the standard itself. The same rule holds true for stains and colors. Balance the contrasts, using values that do not have too great an interval in the scale of color tones.

Recessed panels are made $\frac{1}{8}$ in. deep and may be the same depth throughout or be rounded so that the deepest cut is at the edge of the panel. Raised panels are planed true as to size and shape, but are thicker than $\frac{1}{8}$ in. when glued to the shaft. When the glue is dry they are planed to the desired thickness. If too high a relief is used, unity is lost, as the panels do not seem to be a part of the shaft and the result is a clumsy, ugly job. The raised panels may be cut from cardboard of proper thickness and glued in place if the lamp is to be painted or polychromed. Inlayed surfaces demand careful fitting of the parts. When glued and dried the raised portions are planed and sanded flush with the surfaces.

The placing of the canopy, and rubber insulator, and the connecting of wire to the lamp socket and plug should not offer any difficulties. Glue the 6-in. felt pad to the base to protect the surfaces upon which the lamp is placed.

MACHINISTS' TOOL CHEST

Jos. J. Lukowitz, Milwaukee, Wisconsin

(See Supplement No. 92)

"A place for everything and everything in its place," is the motto of every good mechanic. This is especially true of the machinist who is a worker of great precision and accuracy, and needs a great number of very fine tools. Every boy aspiring to be a machinist, ought to provide himself with a portable tool chest and learn to keep his measuring and gauging tools in perfect condition and always have them readily accessible. A chest like the one illustrated by supplement No. 92, helps to keep the tools in an orderly manner and prevents loss and damage, and is conducive to keeping the tools in condition for doing accurate work. One of the small drawers can be reserved for a machinery handbook, or for any other reference material which may be wanted.

The making of this chest is also a work of precision calling for thought, interpretation of drawing, and resourcefulness. Since the chest is made of thin material for the sake of lightness, and because it is used for carrying heavy tools, it must be very accurately cut and fitted to make it serve its purpose well. It is suggested that the cutting of the stock for the drawers be deferred until after the chest is assembled. This will make it comparatively easy to make them exactly to size, especially if changes in dimensions or arrangement of the drawers is desired. The sizes and arrangement shown in the supplement have proved quite practical, but changes may easily be made. the resultant planning necessary to change this drawing to meet any particular requirement is very much worth while from an educational standpoint for it helps to develop initiative and resourcefulness—a quality which students sometimes sadly lack.

Quarter-sawed oak may be used for the exterior of the chest and birch, cherry, or maple would serve very well for the drawers. If desired, the drawers may be lined with a good grade of green felt. This type of chest is usually given a good varnish finish. The hardware, handle, chest corners, catches, and lock may be purchased from any hardware dealer.

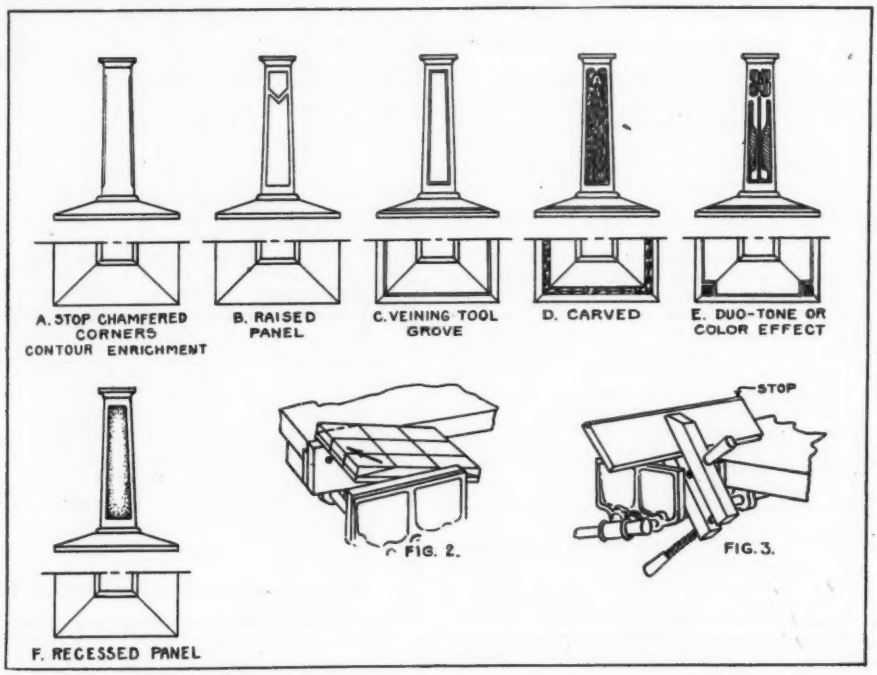
A LIGHT, EFFICIENT, TOURIST TRAILER

M. C. Koenders, Fond du Lac, Wisconsin

(See Supplement No. 93)

Although it may seem entirely out of season to some people, the experienced camper or tourist is already making plans for next summer's vacation. Whether it is to be a trip abroad, a journey to some delightful northern lake or stream, or just an aimless automobile tour, most of us are right now considering the places to go, the cost, and the equipment necessary. It is for the summer tourist especially that the following important accessory to an enjoyable trip was designed.

Nothing will prove so helpful in adding to the comfort and convenience of an auto trip as a light, well designed trailer. Camping luggage can be carried in it which otherwise would take up valuable car space and thus detract from the comfort of the passengers.



Heretofore, while recognizing the desirability of owning a trailer, many people have not possessed one because of the seemingly high prices asked for such a vehicle. But a few spare Saturdays and evenings are sufficient to construct a very handy, light and easily towed trailer for a sum that will not exceed ten dollars, tires included.

Through the use of well selected materials, the weight has been held to about 200 pounds, an insignificant drag for a car. By correct balancing, and a well designed towing arrangement, all side sways and wabbling has been eliminated. After this trailer is well loaded, the tourist may cast aside all worries as to whether or not the load will stay in position properly.

For storing, this vehicle may be placed on end in the garage in front of an automobile, because it takes up very little additional room.

The actual building of this trailer may be done by any person who is handy with the common carpenter tools. The few metal parts needed for this vehicle can be made by a blacksmith, for a small sum.

Several spare hours, a little patience, and a small cash outlay, and any man can build the trailer described, which will prove of value, not only for camping purposes, but also for any other light hauling jobs.

Details of Construction and General Specifications

Axle—Chevrolet front axle complete with steering arms.

Wheels—30x3½ in., either clincher or straight type rims, complete with wheel bearings to fit axle spindles.

Springs—46 in. measured between eyes. Five leaves are sufficient. Four may be used for light loads.

Front shackles—Boiler plate or hard sheet steel, $\frac{3}{32}$ in. or $\frac{1}{16}$ in. thick.

Rear shackles—Use a piece of ½-in. (inside diameter) double-strength pipe, 1½ in. long. Weld this to a base of flat steel ¼ by 1½ by 6 in.

Spring shackle bolts—Either $\frac{7}{16}$-in. or ½-in. automobile bolts. Ream shackle holes to fit.

Chassis frame—Oak ¾ by 2-in. stock. Corners tied by $\frac{3}{32}$ by 2-in. boiler plate, or flat steel strips, bolted to abutting pieces.

Trailer floor—¾ by 2-in pine, hemlock, or any other lumber may be used.

Tow pole and center frame—Pine 2 by 4 by 82 in. Rear end is not square—it is cut off ¾ in. on lower side. Pole tapers from 4-in. width to 1¾-in. width at front end. Taper starts 26½ in. from front end. Taper sides only. Thickness remains constant; ¼-in. bevel on each top edge for the length of the tape only. A metal tongue ¼ by 1¼ by 12 in. extends 5½ in. beyond the end of the tow pole. This is fastened by two ⅜ by 2¼-in. bolts. The heads of the bolts bear on a $\frac{3}{32}$ by 1-in. piece of strap steel on top of the tow pole.

Sides of body—¾ by 9 by 54¾-in. pine.

Rear door—¾ by 9 by 42 in. Two ¾ by 1 by 8-in. cleats are screwed to door on inside to support side boards of body in position.

Front—¾ by 9 by 40½ in. It should fit between the side boards. A ¾ by 4¼ by 42-in. splash board is fastened to top of front piece. The edges of this must be beveled to fit the body. Two supporting irons of strap steel ⅛ by ¾ by 7½ in. support this piece in position. They are bolted to trailer body and screwed to splash board.

Side body-support irons—⅛ by 1 by 10½ in. (approximately). Flat strap steel. Bend to fit. Eight are needed.

Tow-bar brackets—⅛ by 1 by 12 in. These must be bent to fit around tow bar. They are bolted to front and rear cross bars.

In aligning wheels, use the same method as for an automobile. Do not allow any toe-in, or camber. Wheels must be absolutely parallel, or undue tire wear will result, and an excessive drag will be placed upon the trailer and car.

All nuts drawing against metal to be fitted with lock washers. All nuts drawing against wood to be fitted with washers and ends of bolts to be riveted over.

Keep wheels, shackles, bolts, and springs well lubricated.

Fill tires with air according to load carried.

A tail-light is a state requirement on any vehicle using the highways. Substitute a red flag on rear of trailer in the day time.

Side boards may be fitted to this trailer in order to carry loose dirt, etc.

A disappearing leg may also be incorporated in this design, so that the trailer may be left in an upright position alone. Have it fold up against the tow pole when not in use.

Two medium-size hinges and two hasps and fittings conclude the trailer proper. These fit on the rear end and door.

Automobile Tow Bar

Bolt a piece of $\frac{1}{16}$ by 1-in. angle steel of the required length between the two rear-bumper brackets of your car, or else between the two side rails of the car frame.

On a model T Ford, make a U-shaped bracket to bolt to the four spring shackle bolts in the center of the rear frame cross member of the car.

Drill a $\frac{9}{16}$-in. hole in the automobile tow bar and use a ½-in. bolt through this hole and the hole in the trailer tongue. This completes the hitch. Use two lock nuts on this bolt, but do not draw them tight, or else flexibility between the car and trailer will be destroyed. Better yet, use a bolt drilled for a cotter key.

SPINET DESK

Ray Treasure, Muncie, Indiana

The spinet desk shown is a good project for an advanced student in high-school manual training.

The design is so worked out that the Adam Brothers style of leg harmonizes with the rest of the desk.

The construction is rather complex, which makes it a thought-provoking project. It involves both hand and machine work of the following types: boring, tapering, coping, and band sawing, beading, miter jointing, mortising and tenoning, and hinge and lock fitting.

The table part may be constructed either with mortise and tenon joints, or the clamp-nail, and lag-screw construction, which is known as the knock-down type of construction, may be used.

The writer has had experience with both types and prefers the latter, which is shown in detail. This type is not only superior in strength but makes for greater convenience in moving.

The selection of the kind of wood to be used is a matter of individual taste; both mahogany and walnut work well.

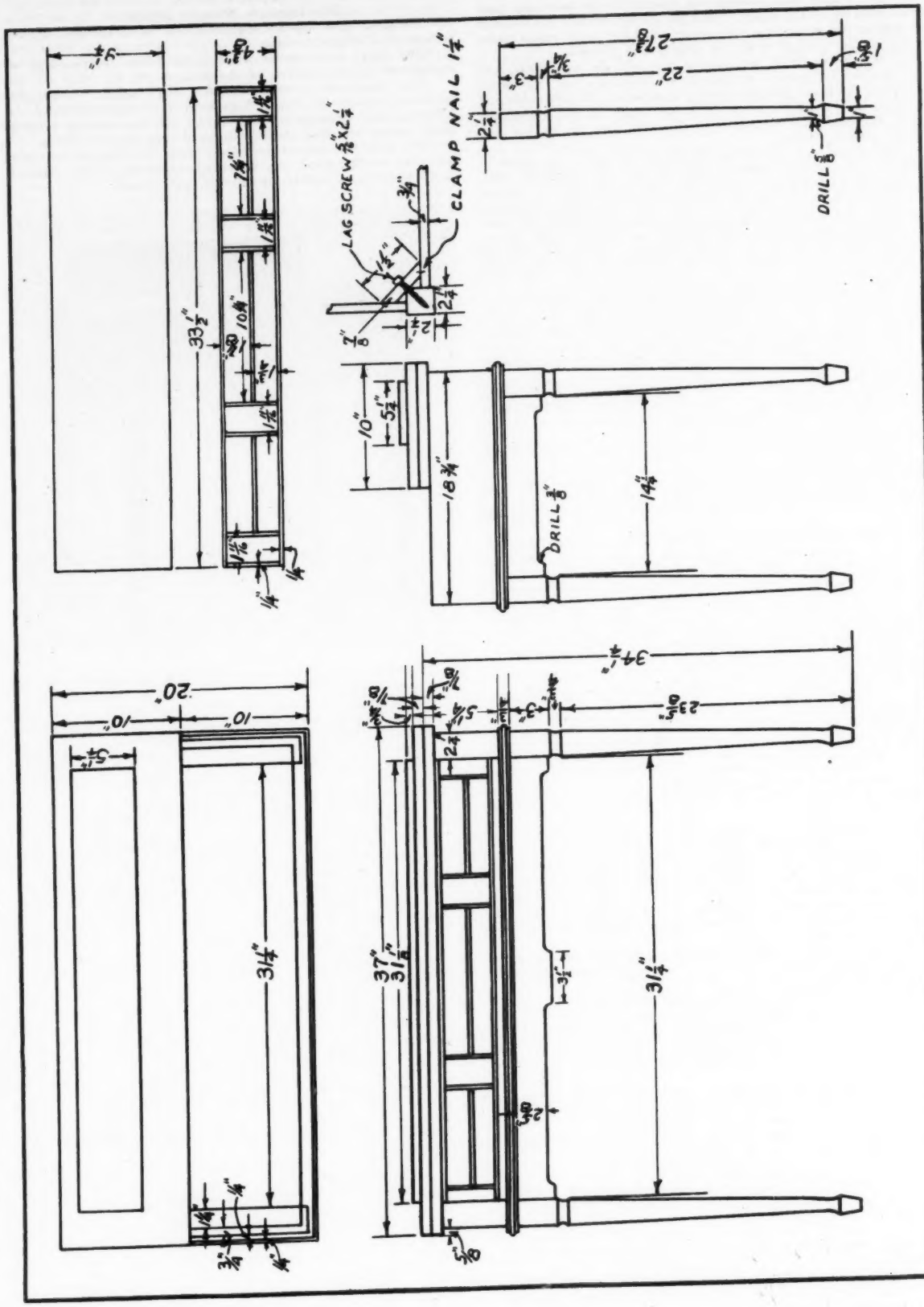
The method of procedure in constructing the desk is as follows:

1. Legs are squared, bored and tapered.
   a) Use ¾-in. bit with legs clamped together.
2. Rails are squared, bored, and band-sawed.
   a) Clamp rails together and bore with ¾-in. bit.
3. Miter corner blocks.
   a) Saw cuts for clamp-nails with thin circle saw or backsaw.
4. Assemble table frame.
5. Bore lag-screw holes and fasten legs to frame.
6. Cut mortises and tenons on pieces for frame and assemble.
   a) Cut bead molding.
7. Miter top rails and assemble.
8. Fasten top rails to frame with screws.
9. Fit fillers to openings.
10. Fasten top with screws.
11. Assemble desk.
12. Fit sliding top.
13. Hinge drop top to main top.
    a) Use long brass piano hinge.
14. Hinge drop lid to drop top.
    a) Two brass hinges ¾x1½ in.
15. Fit lock.
16. Construct pigeonholes and slip into place.
    a) One, two or three drawers may be used.
17. Use varnish or wax finish.

General Note: All stock should be cleaned up and sanded before assembling.

Bill for Material

4 pc.	2¼x	2¼x27⅜	Legs
2 pc.	¾x	3 x31¼	Back and Front Rails
2 pc.	¾x	3 x14¼	End Rails
2 pc.	¾x	5¼x18¾	End Top Rails
2 pc.	¾x	5¼x 2¼	Front Top Rails
1 pc.	¾x	5¼x35¾	Back Top Rail
1 pc.	⅞x10	x37	Top
1 pc.	⅞x10	x37	Drop Top
1 pc.	¾x	5¼x31⅛	Drop Lid
1 pc.	¾x17	x31⅛	Sliding Top
2 pc.	⅞x	1¼x17	Fillers
4 pc.	⅞x	2⅞x 5⅜	Corner Blocks


LAG SCREW ⅜"X2½"
CLAMP NAIL 1½"
DRILL ⅝"
DRILL ⅜"
33½"
10"
5½"
18¾"
14"
20"
34¼"
37"
31⅛"
31¼"
23⅝"
34¼"

SPINET DESK.

Detail for frame:

2 pc. ¾x 3¼x36½
2 pc. ¾x 3¼x16¼
1 pc. ¾x 2 x16¼ Center Piece

Detail for pigeonholes (1 drawer):

1 pc. ¼x 9¼x33½ Top.
1 pc. ¼x 9¼x33½ Bottom
2 pc. ¼x 9¼x 7¼ Shelves
1 pc. ¼x 9¼x10¼ Shelf
8 pc. ¼x 9¼x 3⅞ Upright

CHECKING LIST FOR MECHANICAL-DRAWING TESTS

August Flam, Los Angeles, California

Test No. 1

(Test Appears on Page 70, Feb., 1928)

1.....F	18.....F	34.....F
2.....F	19.....F	35.....F
3.....T	20.....T	36.....T
4.....T	21.....T	37.....T
5.....F	22.....F	38.....T
6.....F	23.....F	39.....T
7.....T	24.....T	40.....T
8.....F	25.....F	41.....T
9.....T	26.....T	42.....F
10.....F	27.....T	43.....T
11.....F	28.....F	44.....F
12.....T	29.....F	45.....F
13.....F	30.....T	46.....T
14.....T	31.....T	47.....F
15.....F	32.....F	48.....T
16.....F	33.....F	49.....T
17.....T		50.....T

Test No. 2

(Test Appears on Page 107, Mar., 1928)

1. Underline item (2)
2. Underline item (1)
3. Underline item (2)
4. Underline item (2)
5. Underline item (2)
6. Underline item (1)
7. Underline item (3)
8. Underline item (1)
9. Underline item (2)
10. Underline item (3)
11. Underline item (3)
12. Underline item (2)
13. Underline item (1)
14. Underline item (2)
15. Underline item (3)

A SHEET-METAL MEGAPHONE

J. W. Bollinger, Tulsa, Oklahoma

The megaphone is a good advanced problem for a sheet-metal class. It involves radial development of cones, wiring a circular edge, and turning a burr on an edge. The megaphone may very easily take the place of, or be made in conjunction with the customary fruit funnel.

The developments of the body and of the mouthpiece are shown in the drawing. Both are held together by means of a seam joint. The wire edge may be put on after the cones have been formed. To put the wire edge on the mouthpiece is a task, unless the shop is equipped with a small-size turning machine, and a small-size wiring machine. In any case, an edge can be turned with a little pains, and the wire put in with the help of a pair of pliers. It also may be finished by turning a burr which is then turned and set down instead of the wired edge, or, the mouthpiece may be omitted entirely.

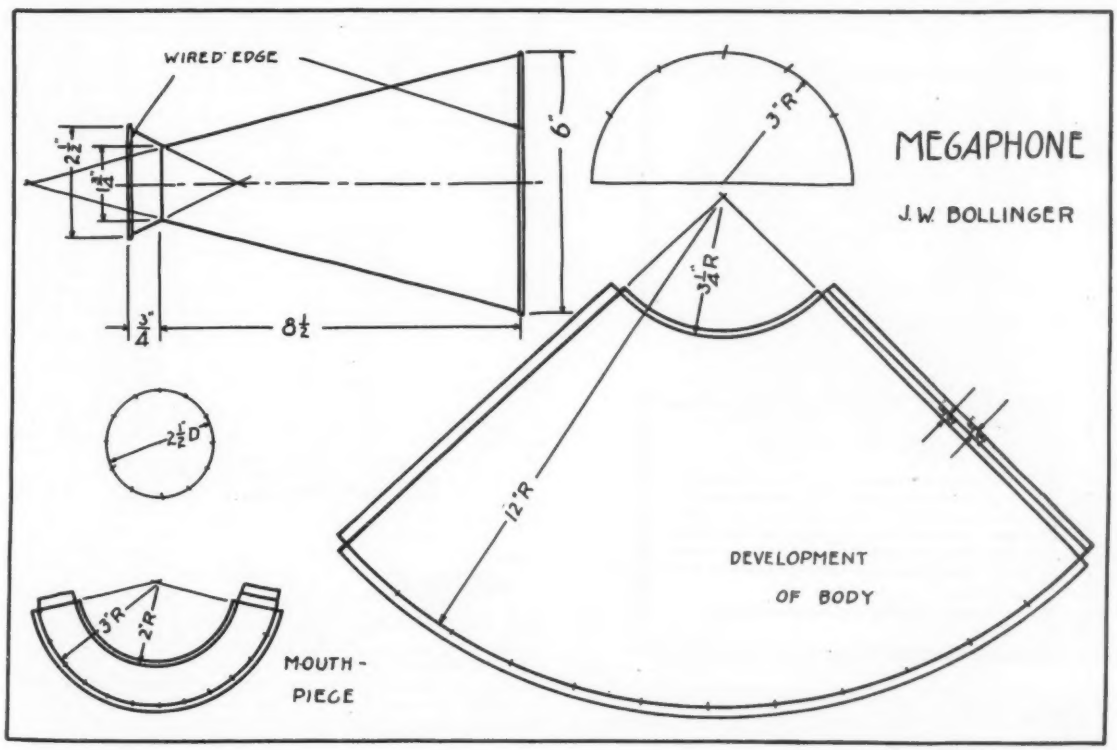
The mouthpiece and the body may be held together in the following manner: Place the small end of the body on the small burring machine, and start a burr which is $\frac{1}{16}$ in. wide on this edge. Do not do more than just barely make a mark. (The same operation could be done over a stake, but not as well.) Now turn a burr on the narrow edge of the mouthpiece. Slip the mouthpiece over the body, and hammer the burrs down. The burr on the mouthpiece will be hammered against the outside of the body; the burr on the body will be set down against the inside of the mouthpiece. If this is done carefully, no solder need be applied anywhere. Of course, the whole job could be soldered; even the seam joint could be made into a plain soldered lap joint.

The finished megaphone may be left as it is, or it may be given a coat of paint.

PRINCIPLES OF VOCATIONAL GUIDANCE ADOPTED BY THE NATIONAL VOCATIONAL GUIDANCE ASSOCIATION

Mr. Roy E. Cahall, speaking recently before the Cincinnati Schoolmasters' Club on the Principles of Vocational Guidance formulated and adopted by the National Vocational Guidance Association, declared that vocational guidance is needed to keep a greater number of pupils profitably in school, and to help them leave school under conditions most favorable for worth-while employment. Mr. Cahall showed that one half of the American pupils leave school at the end of the sixth grade, and one fourth more leave at the end of the eighth grade. Many of these pupils become employed at low wages in blind-alley jobs, while others become loafers with bad companions.

Mr. Cahall defined vocational guidance as the giving of information, experience, and advice which will aid one in choosing an



occupation, preparing for it, entering it, and making progress in it. Under present conditions, the modern American family is seldom able to give adequate vocational counsel to its members. However, society expects that these pupils who leave school early shall become useful members and that they shall fit themselves for an industrial world of which sixth-grade boys have but a faint conception.

At this place in their life, some organization is needed which will come into contact with these sixth-grade boys and give them the counsel which the family is unable to give. The school is the logical organization to aid these young people in choosing their life's work, in preparing for it, in providing the right industrial contacts, and in teaching the need of cooperative action. The school must teach the common occupations and problems of the industrial world so that the pupil may learn his relation to industry and his obligation to society.

Many pupils merely drift through school with little interest in the work and with no idea of how they may apply what they have learned. Schoolwork may be made real to such a pupil if his vocational interests can be discovered and made the motive of his work. It is the duty of the teacher not only to teach the content of the subject matter but also to teach its application to occupations.

Mr. Cahall points out that as the vocational motive is of inestimable value to the teacher in gaining the interest of the pupil, so also some method must be discovered by which the teacher may find the vocational bent of the child. All children before the close of the compulsory school age should be provided with a wide variety of exploratory experiences in academic, commercial, industrial, agricultural, and cooperative activities. This broad course gives the pupil a wider industrial outlook and reveals to his teachers his interests and abilities. These exploratory experiences bring out individual differences in character, mentality, and personal inclinations. These facts, together with progress in school subjects, and abilities as determined by standard tests give the vocational counselor a fair idea of the boy's fitness for a given occupation.

Mr. Cahall points out, that before a child makes his choice of a vocation, he should make a study of the common occupations. This study gives an accurate presentation of each occupation, bringing out the wage expected, the length of time for preparation, and the unpleasant as well as the more alluring details. After these studies, the pupil may be able to choose an occupation; at least he will have determined the field of activity that interests him most. Provision should be made for reconsideration, should his first choice prove unsatisfactory.

The choice of an occupation, according to Mr. Cahall, should be followed by the selection of a course of study which will fit one for his work. The course should teach the pupil his relation to his fellowmen, to industry, and to society as a whole. It should show the nobility of work and instruct him in the traditions and ethics of the trade. The course should duplicate occupational conditions as closely as possible.

In the selection of a course of study which will insure success, Mr. Cahall points out that the course must be sufficiently broad to cover the most common occupations. It should offer part-time and night-school courses for those who are forced to leave school, and for those adults who wish to advance in their work, or to change to another occupation. A school which actually trains its students to meet the industrial and professional demands gains the confidence of the leaders in the industries and has little difficulty in cooperating with them in the vocational work. The more closely the vocational adviser cooperates with personnel managers, with labor organizations, and with employers' organizations, the more valuable does his advice become. With these contacts the follow-up work and employment supervision is easier even after the pupil has withdrawn from school.

The organization needed to give vocational guidance depends somewhat upon the existence of other organizations capable of rendering supplementary service. While a small organization may do effective work in a small place, the larger cities need fully equipped bureaus and a great number of helpers.

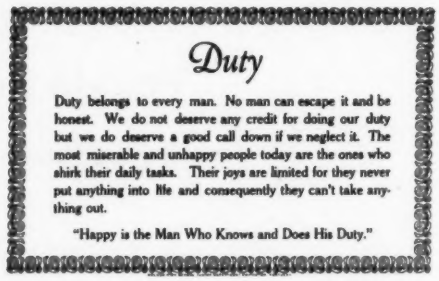
The major purpose of vocational guidance is to help the individual, but it also aims to modify the school and occupational procedures, and to improve the relation between the school and the community in order to further the major purpose.

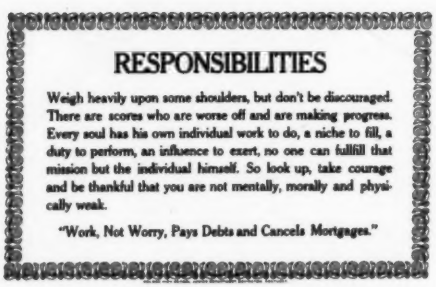
WILL STANDARDIZE LETTERING ON DRAWINGS

The American Society of Mechanical Engineers and the society for the promotion of engineering education acting as joint sponsors, are promoting a movement for the standardization of drawings and drafting-room practice. In connection with the work of standardization, subcommittee No. 3 in charge of the lettering of drawings, has begun the compilation of data which is to serve as a guide in the formulation of a proposed American standard for lettering.

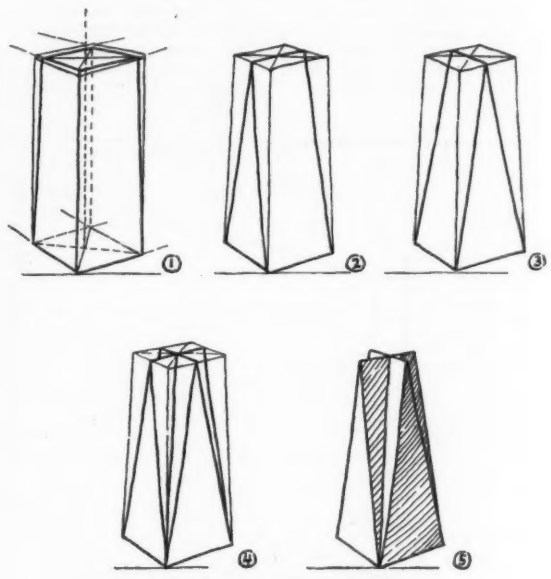
The subcommittee in gathering data on the subject of lettering has issued a questionary which lists six styles of lettering to be checked. The styles include vertical capitals, vertical caps with small caps, vertical lower case, inclined capitals, inclined caps and small caps, and inclined lower case.

The subject of standardizing drafting-room practice is of great importance to drafting-room teachers and the results of the study will no doubt prove of interest to readers of the magazine who use lettering in connection with their shopwork.

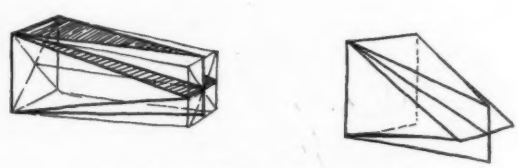

Duty
Duty belongs to every man. No man can escape it and be honest. We do not deserve any credit for doing our duty but we do deserve a good call down if we neglect it. The most miserable and unhappy people today are the ones who shirk their daily tasks. Their joys are limited for they never put anything into life and consequently they can't take anything out.
"Happy is the Man Who Knows and Does His Duty."


RESPONSIBILITIES
Weigh heavily upon some shoulders, but don't be discouraged. There are scores who are worse off and are making progress. Every soul has his own individual work to do, a niche to fill, a duty to perform, an influence to exert, no one can fullfill that mission but the individual himself. So look up, take courage and be thankful that you are not mentally, morally and physically weak.
"Work, Not Worry, Pays Debts and Cancels Mortgages."

EXAMPLES OF WORK DONE BY JUNIOR STUDENTS AT THE HOLMES HIGH SCHOOL, COVINGTON, KY. MR. HENRY A. BREUCKER, INSTRUCTOR.



SUGGESTED METHOD FOR ANALYZING AND SIMPLIFYING OBJECT DRAWING



ALFRED G. PELIKAN, MILWAUKEE, WIS.

"NOW ASK ME ONE"

John F. Faber, Academy High School, Erie, Pa.

This is the fourth installment of questions and answers on vocational education and industrial arts. The last installment appeared in the September, 1927, issue of the INDUSTRIAL-ARTS MAGAZINE.

Questions

1. Who wrote the "Iron Man in Industry"?
2. Does the Smith-Hughes Act set aside an appropriation for industrial-arts work?
3. Who was elected president of the A.V.A. at the Los Angeles meeting?
4. *a*) What degrees do undergraduates work to secure?
   b) Graduate students?
5. Who are affected by the introduction of a trade school into a community?
6. Name three cutting tools used in woodwork?
7. What is the lower age limit set by the Smith-Hughes Act for Federal-Aided evening-school work?
8. What are the educational qualifications for entrance to trade schools, set by the Federal Board for Vocational Education?
9. What are the duties of the Federal Board for Vocational Education?
10. Who comprise the Federal Board for Vocational Education?
11. Who is the present U. S. Commissioner of Education?
12. Give three different methods used in teaching.
13. Where will the 1928 meeting of the A.V.A. be held?
14. Is it lawful to charge a tuition for Smith-Hughes evening-school courses?

(See page 191)

NEW BOOKS

A Course in Electrical Engineering

By Chester L. Dawes. Volume I. Cloth, 589 pages. Price, $4. Published by McGraw-Hill Book Company, Inc., New York, N. Y.

This is the second edition of this college textbook on electrical engineering, and new matter has been added to bring it up to date. It contains numerous illustrations and 100 pages of new questions and problems.

The theoretical discussions throughout the book are enlivened by fully worked out examples, thus making the subject matter more readily understandable.

Essentials of Electrical Work

Geo. A. Willoughby. Cloth, 244 pages, illustrated. Price, $1.60. The Manual Arts Press, Peoria, Ill.

This text is intended to provide the practical as well as theoretical information for an introductory shop course of junior-high-school grade. It is assumed that the shop instruction will include simple work in installing various household devices, bell wiring, the construction of toys and simple electrical devices, and observation of and experimentation with sources of electric power, instruments, etc. Considerable space is devoted to materials and tools and their uses. The language and style of the book are well adapted to the age and ability of 7th- and 8th-grade boys.

Wood and Lumber

By Adnah Clifton Newell. Cloth, 212 pages, illustrated. Price, $2.25. The Manual Arts Press, Peoria, Ill.

This book provides in 27 compact chapters detailed information on the nature and structure of wood, the classification of trees, the physical and chemical characteristics of the most widely used woods, lumber grading, lumber manufacture, standards of size and grade of lumber. The book is nontechnical in language, so far as that is possible, and summarizes in simple and usable form a vast amount and variety of information which the teacher of advanced woodwork and wood finishing needs.

Automotive Essentials

By Ray F. Kuns. Cloth, 400 pages, 6 by 9, illustrated. Price, $1.92. Published by The Bruce Publishing Company, Milwaukee, Wisconsin.

This book covers exactly what its title indicates. It takes up the various units of the automobile and explains their construction and use very thoroughly. At the end of each chapter a set of review questions assists the student in properly organizing the subject matter in his mind. Besides the review questions, the author has worked out a list of research questions and problems for each chapter which will do much to vitalize the study of automotive essentials.

The book is well illustrated and will be found a very valuable textbook for the beginning student in auto mechanics.

Model Ship Making

Book III. By E. Armitage McCann. Cloth, 205 pages. Price, $2.50, net. N. W. Henley Publishing Co., New York, N. Y.

The making of ship models is an attractive form of handicraft that has important cultural values and should interest manual-arts instructors both for school-shop use and as a personal hobby. It would be hard to find a type of model which has greater artistic possibilities or which involves a greater variety of tool processes. Historically, ships are of immense interest and importance, particularly to young men and boys who have any spark of romance.

For American boys, the present book which details the making of a model of the U. S. Frigate Constitution, contains a double value that will readily occur to anyone who remembers the part which the original ship took in the War of 1812, and who considers the graceful, vigorous outlines of the model.

The author has made his drawings and sketches amply complete and detailed for any amateur to follow. His ability to describe processes and procedure with clarity is unexcelled, and he has so combined text with illustration that the work becomes a pleasure to anyone blessed with a modicum of skill and persistence.

Mechanical Drafting Handbook

By Frank R. Kepler. Paper, 127 pages, 6 by 9, illustrated. Price, 60 cents. Published by The Bruce Publishing Company, Milwaukee, Wisconsin.

This handbook will be found to contain just the information needed by the student of drafting. The book consists of three parts. The first is devoted to lettering, use and care of drafting instruments, and the steps that must be followed in making a drawing or tracing. The second part is devoted to drafting-room standards and conventions. Under this heading, such things as proper placing of views, correct dimensioning, the making of section views, screw threads, checking of drawings, etc., are discussed. Part three contains numerous tables which have been found useful in the drafting room.

The handbook will be found to be a handy companion book to any textbook on drafting.

Four-and-Twenty Block Prints

Edited by Glenn Hughes. Paper. The University of Washington Book Store, Seattle, Wash.

Old nursery rhymes are here illustrated by original linoleum Blocks.

DR. G. D. WHITNEY ELECTED PRESIDENT

Dr. Gerald D. Whitney, who was recently elected president of the vocational section of the Pennsylvania Education Association, is director of the vocational-education department of the University of Pittsburgh, Pittsburgh, Pa. Dr. Whitney is one of the progressive vocational men of the Keystone state, and has made a special study of foremanship training. He frequently conducts courses in the subject in the industrial plants in and around Pittsburgh.

DR. GERALD D. WHITNEY,
President-Elect, Vocational Section,
Pennsylvania Education Association

Dr. Whitney, while a patternmaker by trade, is equipped to teach all the subjects in a general shop. He was principal of a school in Michigan for three years, and for ten years was an instructor in the Pittsburgh schools, having charge of the evening-school work for apprentices. He was director of vocational education in Altoona for one year, and state supervisor of industrial education for four years. He resigned this latter position to become head of the vocational department at the University of Pittsburgh.

Dr. Whitney holds an A.B. degree, given by Carnegie Institute of Technology, a master's degree given by Columbia University, and a doctor's degree given by Stout Institute.

ASSOCIATION AND CONVENTION ACTIVITIES

THE SCHOOL CRAFTS CLUB MEETING

The regular monthly meeting of the School Crafts Club of New York City was held on March 24, at the Geneva Restaurant.

Mr. Russell F. Hemion, president of the club, was appointed to represent the club at the Eastern Arts Convention, to be held in April, at Hartford, Conn.

Mr. Harold Haitsch of Perth Amboy, N. J., was accepted as a new member of the club.

An interesting talk on asbestos building material was given by Mr. A. R. Gibbons of the Johns-Manville Company. The talk was illustrated with motion-picture films showing the mining and preparation of asbestos, and mill operations in the preparation of asbestos for the markets.

Mr. A. H. Whitsett, of St. Louis, spoke on, "The Trend of Industrial Arts in the Middle West." Mr. Whitsett spoke of the pioneers in manual training and the advocates of art in manual training, and pointed to the changes which have taken place in the aims and objectives of manual training. At the present time the manual-training work has reached a broad, sane level with emphasis on vocational guidance. In this latest movement, the industrial-arts teacher has an opportunity in this field far greater than any other. Mr. Whitsett approved the general shop limited to three or four occupations and the junior high school, and urged the standardization of the terminology used in school shops.—*H. S. Fletcher.*

VOCATIONAL SOCIETY OF WASHINGTON COUNTY, PENNSYLVANIA, HOLDS MEETING

The second meeting of the Vocational Society of Washington county, Pennsylvania, was held at the high school, Washington, Pa., on Saturday, March 17. The meeting was attended by forty supervisors of industrial arts, home economics, vocational education, and agriculture. Supt. J. C. Stiers of the Washington schools who welcomed the visitors talked on the cost of industrial-arts and home-economics departments. The idea is prevalent among administrators that the cost is too great. Will the boys be any better since taking the industrial-arts course? Will the girls be any better homemakers since taking the home-economics course? This is an age when we must prove that the industrial-arts work is worth while.

Mr. V. A. Martin, state supervisor of agriculture of Harrisburg, in an interesting talk on "Agricultural Projects," portrayed what has been done in the state along this line and showed the possibilities for the future. One boy in the northern part of the state started potato raising with two and one half bushels of seed. Last year he had eighty-five acres in potatoes, with a net profit of $2,700. Mr. Martin is of the opinion that education in vocational agriculture pays large dividends.

Professor W. F. Rasche of the University of Pittsburgh took as his subject "Upgrading the Industrial Arts." He mentioned many ways in which industrial arts may be improved, but the vital point upon which he dwelt is the size of the industrial-arts classes. He reviewed his experience as a supervisor in the Milwaukee Vocational School in which an experiment was conducted with different size classes and it was found that better work is done with a class of thirty than with a class of fourteen. Teachers must be trained, however, to handle larger classes.

Dr. Gerald DeForrest Whitney, head of the department of industrial and vocational educational of the University of Pittsburgh, in a summary of the meeting, gave an interesting report of the Boston Convention which was held last month. Dr. Whitney is of the opinion that the cost of education is not to be considered as the results cannot be measured. We have small Latin classes, and in some schools small classes in science, but we do not say much about the cost of these as they are traditional. Furthermore, the boys and girls used to receive training in the home which is now given over to the school and the cost may be justified in this way.

The home-economics department of the Washington schools, under the guidance of Miss Holiday and Miss Brownlee, and assisted by a number of students, served a luncheon to the visitors.

The Vocational Society of Washington county has a membership of fifty and the expenses of delegates to the state meetings are paid by the county organization.—*George C. Donson.*

A. V. A. TO PHILADELPHIA

The American Vocational Association will hold its 1928 convention at Philadelphia. The exact dates have not been set, but it is likely that December 13, 14, and 15 will be the dates.

New Jersey Vocational and Arts Association Holds Meeting. The New Jersey Association held its twelfth annual convention March 30 and 31, at the Treat Hotel, Newark, N. J., with Pres. J. H. Constantine presiding at the general sessions.

At the industrial-arts session, Mr. Arthur L. Perry of Rahway, spoke on "Vocational Guidance Possibilities in Industrial Arts"; Mr. Charles Barnes of East Orange, talked on "Correlating Industrial Arts with Academic Subjects"; and Mr. F. C. Schmitz of New York City, discussed "The Manufacture and Uses of Mahogany."

At the vocational sesssion, Mr. W. A. O'Leary of the state education department, talked on "Training for Vocational Adjustments"; Dr. R. E. Pickett of New York University, discussed "The Place of the Adolescent Industrial School in the Educational Program"; Mr. Michael Greengrass of Paterson, took the subject, "Cooperation Between the Printing Teacher and Academic Teacher"; Miss Dorothy Porter of Elizabeth, talked on "Cooperation Between the Printing Teacher and Art Teacher"; and Mr. P. L. Miller of Atlantic City, discussed "The Vocational Printing Course."

At the continuation-school session, Mr. Ralph Parker of Camden, N. J., talked on "The Effect of the Continuation School on Delinquency from the Standpoint of the Attendance Department," and Miss Mary Jones of Newark, discussed "The Continuation School as an Aid to the Stabilization of Juvenile Employment."

New York State Printing Teachers Will Hold Spring Meeting at Ithaca. The executive committee of the New York State Printing Teachers' Association has announced that the annual spring meeting of the association will be held April 13, at Ithaca, N. Y. The printing teachers of Ithaca will be hosts to the convention. Mr. Don A. Johnson, director of the Empire State School of Printing, who extended the invitation for the meeting, is one of the leading exponents of printing in New York State.

Officers Elected for National Vocational Guidance Association. The National Vocational Guidance Association, at its last meeting in Boston, elected Dr. Mary H. Hayes of New York as President; Dr. Wm. M. Proctor of California, first vice-president; Mr. C. C. Robinson of New York, second vice-president; Miss Emma P. Cooley of New Orleans, secretary, and Miss Bertha Shepherd of Boston, treasurer. John Stark of Pittsburgh, and Miss Leona Buchwald of Baltimore, were elected trustees.

Manual-Training Teachers of Paterson Hold Meeting. The manual-training teachers of Paterson, N. J., held a meeting on March 15, with Mr. Fred Thompson presiding. Mr. W. E. Alexander, the first speaker, talked on "Projects of Value in the School Shop"; Mr. David Petrie took for his subject, "My Method of Procedure with Beginners in Shopwork"; and Mr. W. E. Smith explained a series of twenty lessons in printing modeled on the present course of study. Mr. Fred Thompson closed the meeting with a report of the activities at the recent convention of the Department of Superintendence in Boston.

Officers Elected for the Newark Manual-Training Association. At the recent meeting of the Newark Manual-Training Teachers' Association, held at Newark, N. J., Mr. Harlow H. Curtis was elected president to succeed Mr. Charles L. Dacey; Mr. William Hatch was elected vice-president; Mr. Willard M. Elliott as secretary, and Mr. W. E. Barnes as treasurer.

The year 1927 was the most successful in the history of the organization. A field day and several get-together affairs were held. One of the most enjoyable evening affairs was that at Essex Falls, when Mr. and Mrs. A. D. Backus entertained the members at their country home. The grand windup of the year took place on the evening of February 18, when the organization gave a complimentary dinner to the principals of the Newark schools. Each member was host to his own principal. Supt. John H. Logan and Supervisor Allen D. Backus were present. The principal speakers were Dr. F. D. Blodgett and Mr. Thomas C. Sheehan. Dr. Blodgett talked on "Essentials of Education," and Mr. Sheehan on "What Industry Expects of Education."

The Newark organization comprises 75 active members representing the high and elementary schools, mechanical drawing, manual training, and printing departments.

Pacific Arts Association Meeting. The fourth annual meeting of the Pacific Arts Association will be held April 4 to 7, at the University of Washington, Seattle. The Association is the youngest member of the Federated Council on Art Education, and is doing work similar to the Eastern and Western Art Associations.

The general sessions will be held in the auditorium of the forestry building of the state university. Eight speakers will be on the program each day in presenting art philosophy and practice.

The local committee on arrangements is composed of Miss Helen Rhodes, at the University of Washington, and Miss Clara P. Reynolds, director of art in the Seattle public schools.

Southern Illinois Industrial-Arts Group Meets. The Industrial-Arts Discussion Group was organized on February 11, at Centralia, Ill., with an initial membership of eleven manual-arts men. The purpose of the organization is to afford an opportunity to become acquainted, to present problems, and to exchange ideas so that each instructor may be better able to solve his own problems. Mr. A. B. Mays of Urbana, who was present at the meeting, contributed a number of suggestions that proved valuable in the organization of the society.

The next meeeting will be held April 14, at Benton, Ill.

TENTATIVE PROGRAM OF THE WESTERN ARTS ASSOCIATION

The program committee of the Western Arts Association has announced the tentative program for the annual meeting to be held May 2 to 5, at Indianapolis, Ind. The speakers and the topics to be discussed are as follows:

Wednesday Morning, May 2

Registration of delegates.

Special demonstrations in the art, home-economics, and manual-training departments of the grade and high schools.

Wednesday Afternoon, May 2

Art Round Table: Mr. Alfred G. Pelikan, Milwaukee, chairman.

An Evaluation of Present Aims and Tendencies in Art Education—Mr. C. Valentine Kirby, director of art for the state of Pennsylvania.

Art in the Junior High School—Miss Clara A. Kruse, district supervisor of art, Chicago, Ill.

A Supervisor and Her Problems—Miss Grace Stackhouse, Cleveland, Ohio.

Home Economics Round Table: Miss Julia R. Grady, Madison, Wis., chairman.

How Art is Being Related to Subject Matter in Schools Today. Miss Joanna M. Hansen, Iowa State College, Ames, Iowa.

Methods of Teaching Art in Clothing—Miss Ivah M. Rhyan, Terre Haute, Ind.

Manual Training Round Table: Mr. L. R. Abbott, Grand Rapids, Mich., chairman.

Some Recent Changes in the Manual-Arts Problem—Dr. Wm. T. Bawden, associate superintendent of schools, Tulsa, Okla.

Testing in the Manual Arts—Mr. Roy R. Van Duzee, supervisor of industrial arts, West Allis, Wis.

Some New Problems of the Manual-Arts Teacher—Mr. Albert F. Siepert, Bradley Polytechnic Institute, Peoria, Ill.

Vocational Round Table: Mr. W. Harold Gossett, Indianapolis, Ind., chairman.

To What Extent Should Practical Production Problems Be Carried on in Vocational Classes, and How Can They Be Carried On Without Exploitation or Unfairness to the Tradesman—Mr. C. F. Webber, South Bend, Ind., Mr. M. M. Proffitt, Washington, D. C., Mr. Ammon Swope, Lafayette, Ind.; and Mr. H. J. Westriene, Hamtramck, Mich.

Printing Round Table: Mr. L. A. Reppert, Chicago, Ill., chairman.

The Attitude of the Printing Industry Toward Printing Education—(the craftsman), Mr. John H. Chambers, Indianapolis, Ind.; (the employer), Mr. F. J. Hartman, Chicago, Ill.; (the manufacturer), Mr. Thomas Knapp, Chicago, Ill.

Wednesday Evening, May 2

Address of Welcome—Mr. Charles F. Miller, superintendent of schools, Indianapolis, Ind.

President's Address—Mr. George S. Dutch, Peabody College for Teachers, Nashville, Tenn.

Art as a Constructive Force in Education—Mr. Leon L. Winslow, director of art education at Baltimore, Md.

Thursday Morning, May 3

Experiences of a Salesman of Art Education—Mr. C. Valentine Kirby, Harrisburg, Pa.

Art as Related to the Home—Miss Joanna Hansen, Iowa State College, Ames, Iowa.

Thursday Afternoon, May 3

Joint Round Table: Messrs. Abbott and Gossett, chairmen.

What Effect Has the Advent of Vocational Education Had on the Manual-Training Program?—Mr. M. M. Proffitt, Washington, D. C.

Industrial Photography: Is It an Art or a Vocation?—Mr. L. A. Williams, State Teachers' College, St. Cloud, Minn.

Friday Morning, May 4

Joint Round Table: Messrs. Pelikan and Abbott, chairmen.

The Need of Art in Manual Training—Mr. Alfred G. Pelikan, director of art at Milwaukee, Wis.

Friday Afternoon, May 4

Joint Round Table: Messrs. Pelikan and Reppert, chairmen.

Art in Printing.—Mr. J. L. Frazier, Editor, The Inland Printer, Chicago, Ill.

The Relation of the Printing and Art Department—(the printing instructor), Mr. C. W. Hague, Stout Institute, Menomonie, Wis.; (the art instructor), Mr. Otto Hankhammer, State Teachers' College, Pittsburg, Kans.

Joint Round Table: Miss Hansen and Mr. Pelikan, chairmen.

Friday Evening, May 4

Address—Mr. Wm. H. Stone, Ohio State University, Columbus, Ohio.

The Mental Slant of a Real Teacher—Mr. Milo H. Stuart, principal, the Arsenal Technical Schools, Indianapolis, Ind.

Saturday Morning, May 5

Address—Mr. Frank D. Slutz, director of the Moraine Park School, Dayton, Ohio.

Award of Prizes.

Business Meeting.

Answers

(See page 189)

1. Arthur Pound.
2. No.
3. R. L. Cooley of Milwaukee.
4. *a*) Bachelors.
   b) Masters or doctors.
5. School executives, instructors, industry, students, parents, taxpayers, and perhaps the unions.
6. Chisel, plane, knife.
7. Sixteen.
8. That the individual admitted can and will profit from the instruction offered.
9. *a*) To cooperate with state boards in carrying out the provision of the Smith-Hughes Act.
   b) To make, or cause to be made, studies, investigations, and reports, with particular significance to their use in aiding the states in establishing vocational schools and classes and in giving instruction in agriculture, trades and industries, commerce and commercial pursuits, and home economics.
10. *a*) Secretary of Agriculture.
    b) Secretary of Commerce.
    c) Secretary of Labor.
    d) U. S. Commissioner of Education.
    e) Three citizens appointed by President, by and with the advice and consent of the Senate.
       1. One to represent manufacturing and commercial interests.
       2. One to represent agricultural interests.
       3. One to represent labor.
11. Hon. John F. Tigert.
12. Supervised study, project method and the Winnetka plan.
13. Philadelphia.
14. No.

VOCATIONAL REHABILITATION DEPENDENT UPON MORALE

Vocational rehabilitation is very often dependent upon factors other than vocational, according to a recent statement of the Federal Board for Vocational Education.

In order to rehabilitate a man or woman vocationally, the board finds that it is often necessary to effect physical reconstruction, restoration of morale, or even moral rehabilitation. A man who loses his economic status is often forced to accept charity and later may even beg in order to provide for himself and family. Complete rehabilitation for such a person means restoration to his former position physically, vocationally, socially, and morally.

The vocational rehabilitation service of the states has been conceived fundamentally as one of vocational advisement and training. However, when other services become necessary they are secured through agencies which operate specifically for these purposes. The administration of a state program of vocational rehabilitation, according to the board, is concerned with other forms of rehabilitation only as antecedent or incident to the service of vocational reestablishment. It is frequently found that physical disabilities, while apparently permanent or fixed in degree, are either wholly or partially removable. Obviously, it is unthinkable that a state rehabilitation department will provide a service of training around a disability in the case of a person with a removable handicap.

In practice there are two relations between physical restoration and vocational rehabilitation: In one case physical restoration may in itself be vocational rehabilitation; in the other it may be an antecedent to vocational rehabilitation. Vocational rehabilitation cannot be accomplished unless there is a restoration of morale.

MR. ADAMS HEADS OREGON DEPARTMENT

Mr. Orville D. Adams, who has become director of vocational education of the state of Oregon, has formerly been holding the position of supervisor of vocational education in the same state.

He is a graduate of the State Normal School at Bellingham, Wash., and has completed special courses at the University of Washington, Oregon State College, and other institutions. The foregoing is in place of the information given on page 79 of our February, 1928, issue.

Previous to the positions which Mr. Adams held in Oregon, he was superintendent of schools at Silver Lake, Wash.; principal of the high school at Kelso, Wash.; and attendance officer, and later coordinator of the Seattle public schools.

He is a frequent contributor to educational magazines in the industrial-arts field, and is the author of a number of special trade analyses.

NOW, ARE THERE ANY QUESTIONS?

Mechanical-Drawing Tests

776. Q.: One of the teachers referred me to you as having published some tests in mechanical drawing in one of your magazines of last year. Will you kindly let me know some details about these tests? I am a mechanical-drawing instructor, and am at present very much interested in such data.—*E. E. S.*

A.: *Mechanical Drawing Tests:* Christy's "Measuring Scale for Mechanical Drawing." $5. Manual Arts Press, Peoria, Ill.

Reading Test for Mechanical Drawing—Md.-1; Missing Line Test for Mechanical Drawing—Md-2. Hunter Shop Test Series. 25 cents. Manual Arts Press, Peoria, Ill.

Articles on Tests: Published in the INDUSTRIAL-ARTS MAGAZINE. "Constructing a Scale for Grading Mechanical Drawing," Nov., 1920, p. 431; "Three-Minute Tests for Mechanical Drawing," Dec., 1923, p. 470; "Speed Test in Mechanical Drawing," Aug., 1924, p. 319; "Standardizing the Rating of Mechanical Drawing," Oct., 1924, p. 390; "Rating Mechanical Drawing," May, 1926, p. 176; "Plan for Rating Mechanical Drawing," Aug., 1927, p. 295; "Mechanical-Drawing Tests," Feb., 1928, p. 70, and Mar., 1928, p. 107.

Spiral (Helical) Wood Turning

777. Q.: Will you kindly give me information on the complete process of spiral turning on a wood lathe?—*J. R. W.*

A.: For information on spiral turning on a wood lathe see Milton & Wohler's "Wood Turning." Price, $1.50. Published by The Bruce Publishing Company, Milwaukee, Wis.

Reconditioning Used Engine Oil

790. Q.: I have a lot of old engine oil that has done 1,000 miles. Can this be strained in any simple manner for use again, or is its lubricating value completely destroyed? Its chief impurities are dust and carbon.—*H. D.*

A.: Engine oil in the automobile loses its lubricating quality first of all, because such matters as dust, carbon, and metal particles become mixed with it, and secondly, because it is diluted with gasoline and water of condensation. To make this oil usable again, it is necessary first of all to filter it; secondly, to remove the causes of its dilution. To do all of these things makes a cumbersome and expensive proposition.

The filtering would be easy enough to do, but to get rid of the water, etc., would require distilling or some other treatment of that kind. Furthermore, if several different kinds of oils are put together, there might be some chemical affinity between them which would make the process of reconditioning the oil of rather doubtful value.

Kite-Flying Contests

793. Q.: Can you tell me where I might find material covering rules governing kite-flying contests and also where I might get information on kite construction?—*D. C. B. and R. R. D.*

A.: Material on kite-flying contests may be found in the following books:

"Kitecraft and Kite Tournaments," Miller. $1. Manual Arts Press, Peoria, Ill.; "Construction and Flying of Kites," Miller. 25 cents. Manual Arts Press, Peoria, Ill.; "The Kitebook," Kilvert. $1.25. Dodd, Mead & Co., New York; "Manual Training Toys for the Boy's Workshop," Moore. $1. Manual Arts Press, Peoria, Ill.

In the April, 1928, issue of the INDUSTRIAL-ARTS MAGAZINE there appeared a news note on a kite-flying contest on page 38A.

Toymaking and the Project Metthod

795. Q.: I am anxious to secure material concerning woodworking along the project method and toymaking line.—*J. H. E.*

A.: You can find material describing the project method in the following articles which appeared in the INDUSTRIAL-ARTS MAGAZINE:

Dalton Plan: "Dalton Plan Applied to Manual Arts," Aug., 1927, p. 283; "Dalton Plan in the Manhattan Trade School for Girls," June, 1924, p. 220; "Saving Time Under the Dalton Plan," April, 1925, p. 132; "Why Daltonize Vocational Education?" March, 1926, p. 88.

Industrial-Arts Projects—Articles: "Type Project for Sixth Grade," Nov., 1924, p. 414; "Project in Wood Turning," Oct., 1927, p. 396; "What Our Boys Have Done This Year," Aug., 1918, p. 308; "Three Opportunity Problems," Dec., 1919, p. 484; "Standards of Measurement for Determining Productive Value of School Shop," May, 1923, p. 200; "Productive Work in the Shop," March, 1921, p. 83; "General Project Method for Teaching Industrial Arts," April, 1920, p. 131; "Ideal Group Project," May, 1925, p. 194; "Individual Project Method on the Group Plan," Aug., 1923, p. 305; "Making of Furniture for School Dormitory," April, 1923, p. 159; "Project Analysis—A Bedside Table," Jan., 1926, p. 27.

Toymaking: "Every School Its Own Toy Shop," Dec., 1922, p. 489; "How a Newspaper Contest Stimulated Toymaking in Oklahoma City," Jan., 1922, p. 32; "New Kind of Toyland," Feb., 1919, p. 63; "Toymaking for Santa Claus," Oct., 1918, p. 394; "Toymaking in Detroit Schools," Nov., 1927, p. 422; "Toys and the Shop," Dec., 1927, p. 472; "Factory Plan Project—Toy Sleds," Jan., 1918, p. 11; "Stationary Toys," Oct., 1920, p. 411; "Toy Railroad Equipment," Jan., 1923, p. 31; "Wooden Toy Animals," Dec., 1920, p. 499.

Books on Toymaking: "Toy Design Folios," M. C. Dank, $1-$2. M. C. Dank, 465 Liberty Ave., Brooklyn, N. Y.

"Advanced Toymaking," Mitchell. $1.45. Manual Arts Press, Peoria, Ill.

"Handcraft Projects," F. I. Solar. $1.25. Bruce Publishing Co., Milwaukee, Wis.

"Toycraft," L. H. Baxter. $1.30. Bruce.

"Educational Toys," Petersen. $1.80. Manual Arts Press.

"American School Toys," C. A. Kunou. $1.35. Bruce.

"Manual Training Toys for the Boys' Workshop," H. W. Moore. $1. Manual Arts Press.

"Homemade Toys for Boys and Girls," A. N. Hall. $1.25. Lothrop, Lee & Shepard, Boston, Mass.

"Toymaking in School and Home," Polkinghorne. $2. Hubbell-Leavens Co., New York.

"Shop Problems on Tracing Paper (Series No. 12, Toys)," 35 cents. Manual Arts Press.

"Toys Every Child Can Make," Wright. $1.60. Bruce.

"Model Boat Building for Boys," Cavileer. $1.65. Bruce.

"Boy Bird House Architecture," Baxter. $1. Bruce.

"Permanent Bird Houses," Califf. $1. Bruce.

"Coping Saw Work," Worst. $2.40. Bruce.

"Hand Work for Boys," Hughes. $1.50. Bruce.

Tile Setting

796. Q.: Our vocational shop has designed and constructed a built-in cabinet in the kitchen of the school. We desire to cover the worktable and the space between the lower and upper parts of this cabinet (wall) with porcelain tile.

Can you give me the name of a book which fully describes the proper procedure in setting tile on such surfaces?—*R. A. P.*

A.: "Color Cement Handicraft," Lemos. Price, $5. Published by The Davis Press, Worcester, Mass. (Cement tiles and woodwork, tile patterns for wall and floor.)

Wood Carving

797. Q.: Can you give me names of books on school and amateur carving?—*G. H. W.*

A.: *Wood Carving:* "Practical Wood Carving," Rowe. $3. Manual Arts Press, Peoria, Ill.

"Wood Carving," Simmonds. 50 cents. Manual Arts Press.

"Simple Carving," Jack. Manual Arts Press.

"Wood Carving." $1.75. J. B. Lippincott Co., Philadelphia, Pa.

"Toy Carving for Children," Ellis. Manual Arts Press.

"Further Notes on Toy Carving," Ellis. Manual Arts Press.

LOYOLA EDUCATIONAL INDEX

Under the title of "Loyola Educational Index," the Loyola Press, 28 North Franklin St., Chicago, has begun the publication of a monthly cumulate index to educational periodicals.

This initial issue indexes articles which have appeared in 97 periodicals published in the United States and Great Britain. Each article is given a threefold entry according to title, author, and subject. It is planned to issue the material in an annual volume.

A limited number of educationl books is separately indexed.

The subscription price of the new publication is to be $15 per year.

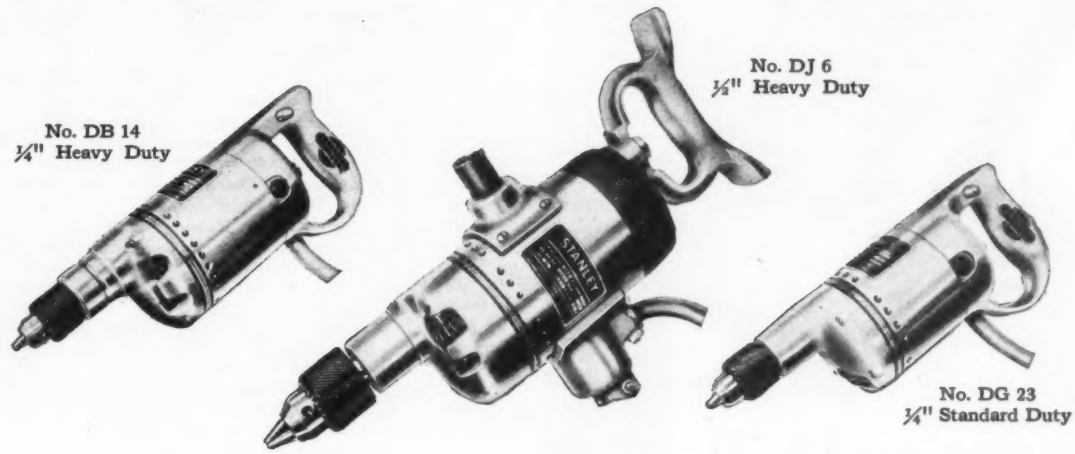
PROGRESS OF VOCATIONAL AGRICULTURE IN WEST VIRGINIA

A recent report on vocational agriculture shows that more than seven hundred students in vocational agriculture in West Virginia completed the practice work in day classes during the last year. It is pointed out that teachers in the state have endeavored to improve the quantity and quality of the work through an increase in the size and scope of the projects offered, through a reduction of projects low in training opportunities, and through the establishment of definite goals for teachers, teacher trainers, and supervisors.

During the year, teachers, teacher trainers, and supervisors have cooperated with the high-school curriculum committee in formulating courses of study in agriculture for the junior and senior high schools of the state. The state course of study has been approved and adopted for a five-year period from July, 1927, to July, 1932.

ANNOUNCING

a line of better electric drills with new standards of performance



Now Stanley makes electric drills! These drills are the result of two years of research, experiments, and exacting tests. They have the same high quality and efficiency as all Stanley Tools.

Before offering Stanley Drills to you, we have placed a number of them in woodworking shops and manufacturing plants for a practical trial. Without exception, the workmen who have used the drills report that Stanley Electric Drills are superior to any similar tool they have used.

A Stanley Electric Drill, equipped with our Bench or Wall Stand and attachments, will make a valuable addition to Woodworking, Machine, Automotive or Sheet Metal Shops.

You can examine the new Stanley Electric Drills at your dealer's. Write for our booklet S59—it contains a full description of these new electric drills.

THE STANLEY RULE & LEVEL PLANT
Educational Department, New Britain, Conn.

STANLEY TOOLS

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Educational Department, New Britain, Conn.
Please send me description of the new Stanley Electric Drills.

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STANLEY TOOLS

Points on Drill Grinding

Putting a proper point on the business end of a twist drill doesn't sound hard—but the fact is that 11 pages, or practically 25% of the "Handbook for Drillers," are devoted exclusively to this all-important thing. In reality pointing a twist drill is a delicate piece of work calling for great skill, and much advance knowledge.

If you would like copies of the Handbook for the use of students in machine shop practice, we shall be glad to send them to you, without charge, in any reasonable quantities.

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PERSONAL NEWS NOTES

Mr. Harvey W. Waffle, supervisor of industrial arts at Kilbourn, Wis., has been reelected for a fifth consecutive term. Mr. Waffle is also a member of the manual-arts general advisory subcommittee, recently appointed in Madison. Mr. H. W. Schmidt is chairman of this committee.

Mr. Ernest Umpleby and **Mr. G. H. Pfeif** have been appointed on the advisory board of the vocational school at Schenectady, N. Y.

Mr. L. L. Smith has been appointed as instructor in trades and industries at Falls City, Nebr., to succeed Mr. R. E. Hunter.

Mr. E. L. Smith has been appointed as manual-training instructor in the elementary schools at Evansville, Ind.

Miss Getha S. VanderBrook of Kalamazoo, Mich., has been appointed as instructor in art at Mt. Pleasant, to succeed Miss Ruth Strome.

Mr. J. B. Payne of Bellefonte, Pa., has resigned as county vocational superintendent for Centre county, to become general superintendent of a large summer home near Pittsburgh.

Mr. L. M. Larson and **Mr. Grant Ford** have been reappointed as members of the vocational board at Wausau, Wis.

Mr. Perry W. Reeves of Indiana, has been appointed a member of the Federal Board for Vocational Education. Mr. Reeves succeeds Mr. H. L. Fidler, whose term expired in June, 1927.

Mr. F. H. Goodman of Des Moines has succeeded Mr. Cecil Waldron as manual-training instructor in the west-side schools.

Mr. C. E. Stahl, formerly instructor in science in the Otis Hower Trade School, Akron, Ohio, died at his home in Ruggles, on March 4, after a long illness. Mr. Stahl had taught since 1908, and had been teaching at the Hower Trade School since last September.

Mr. E. K. Freed, formerly teacher of auto mechanics in the Central High School, Erie, Pa., has been appointed to the supervisory staff of the industrial-arts department.

Mr. Howard Kinder, teacher of shopwork in the Jackson Elementary School, Erie, Pa., has been promoted to the position of auxiliary teacher in the industrial-arts department.

NEWS AND NOTES

The Dubuque Vocational Program. The public schools of Dubuque, Iowa, under the direction of Supt. F. G. Stevenson and Mr. W. B. Galloway, have undertaken a most comprehensive vocational program.

The program includes classes in every phase of vocational work which is reimbursable under the provisions of the Smith-Hughes law and approved by the state board for vocational education. The following classes are now being successfully conducted under the different branches of the program: Twelve classes for mechanics and women in the evening school, with an enrollment of 104 men and 76 women; two classes in part-time trade-extension work for railroad apprentices, with an enrollment of 54 boys and 79 girls; three classes in extension nurse-training work, with an enrollment of 44 apprentices; and four classes in unit-trade subjects, with an enrollment of 112 boys.

The high-school program includes classes in drafting, blue-print reading, mathematics, science, printing, machine-shop practice, and woodworking.

In the shop classes, which include machine shop and woodwork, the workers take advanced work in their everyday employment, and may further improve themselves in skills and abilities. Along with these practical subjects, instruction is given in blue-print reading to all workers, who require a knowledge of that subject in their daily employment. Related mathematics is taught to enable the worker to make the necessary calculations required in his job, whether it be working out a train of gear wheels, or measuring a board. The machine-shop course includes straight and taper turning, thread cutting, drilling, chuck work, planing, drilling with tool design, grinding, and tempering.

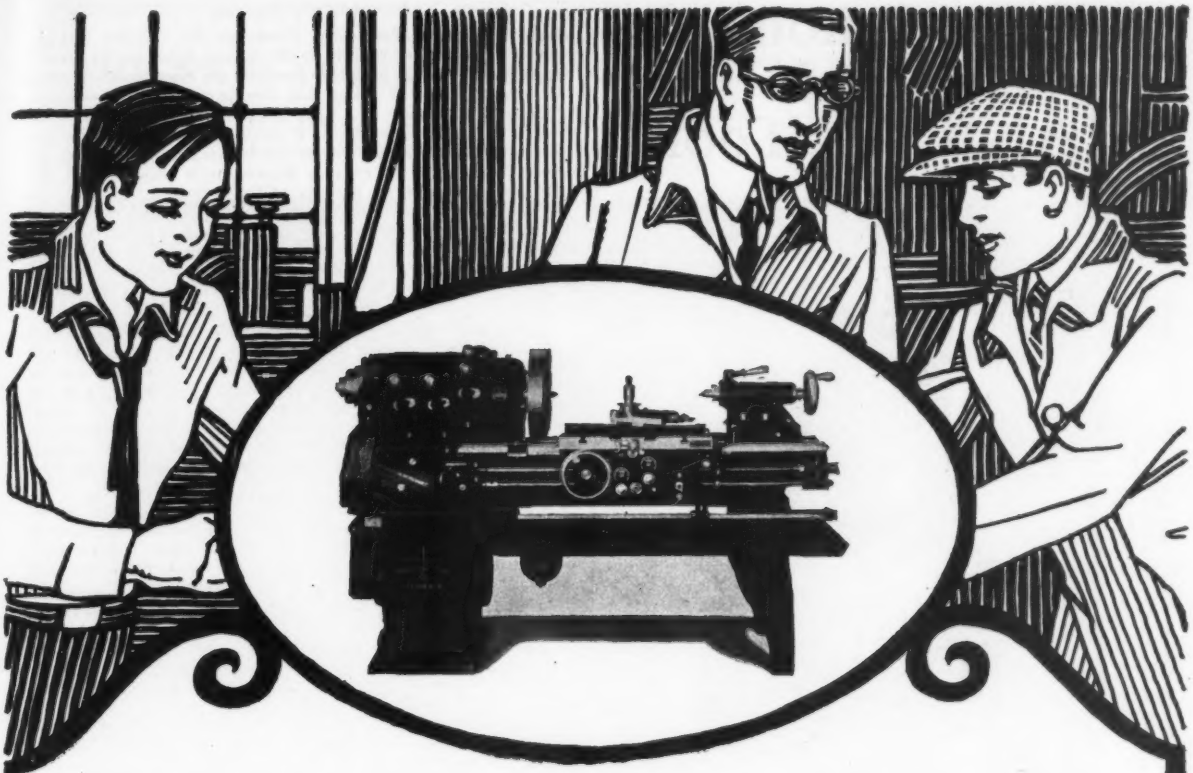
In the shop drawing classes, students are given drawing directly related to their steady employment, either in the woodworking or the metal trades, and students may bring their correspondence courses in mechanical drawing and work on them in evening classes.

The success of an evening school depends on the interest of the student in the courses offered, and Dubuque has endeavored to keep abreast of the times by offering classes in subjects which are of vital interest to workers, both at home and in the factory.

New York Continuation Schools Get State Aid. Continuation schools of New York state will receive state aid under the provisions of the Dick law, which was recently signed by Governor Smith. It is estimated that the New York City schools will receive approximately $600,000 under the provisions of the law.

Printing as a College Course at Carnegie Institute. Printing courses of college grade were first offered fifteen years ago at the

(Continued on Page 38a)



Train Your Students for Their Jobs — Use MONARCH LATHES

Train your students on MONARCH LATHES and when they go from your school they will be ready for their jobs —valuable men immediately without the necessity of going through another period of training in the shop.

The student that is trained on a Monarch Lathe is trained in actual shop practice — for the Monarch is the first choice of Industrial America. Today more Monarch Lathes are being sold to industrial plants than any other lathe built.

The Monarch motor-driven, helical geared Lathe is the ideal equipment for instructional purposes. It is far in advance of other lathes in design. It is as near danger-proof as any lathe can be made. It is as noiseless as any lathe can be—an important advantage in the instruction room.

Monarch Lathes are used in the Massachusetts Institute of Technology, Yale, Cornell, and in hundreds of the best technical and high schools — proof that the Monarch is the practical lathe for modern school equipment.

The success of your school and the success of your students are inseparably linked together. Use MONARCH LATHES and meet the modern demand for training that *fits men for their jobs.*

Illustration above shows 14 x 6 helical geared Monarch Lathe

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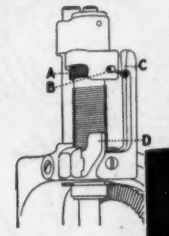
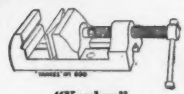
Good Schools deserve "YANKEE" Tools



A—Ratchet teeth. B—Ratchet Shifter, shown in "knock-off" position at extreme of up movement. C & D—Automatic "knock-offs" at top and bottom of movement to prevent jamming.

This lever controls the Automatic Feed. Friction feed runs drill down to work. Then you shift this lever to horizontal position and Ratchet Feed takes hold, keeping pressure steady and uniform.

Gear Shifter between small gears gives fast, slow or locked at a touch.



"Yankee" Vise No. 990

For use on bench drills, and other machines. Made true on all sides. Jaws 3 in. wide. 1⅞ in. deep.

You get Perfect Pressure —Automatically

When you use a "YANKEE" Bench Drill, you don't have to regulate the pressure.

The drill itself gives the correct pressure, reducing breakage of drills to a minimum. It does away with hand feeding and saves time and money.

Friction Feed runs drill down to work. Then Ratchet Feed goes into operation. Automatic throw-off prevents jamming.

"YANKEE" Automatic Bench Drill

No. 1005 (illustrated). Two speeds, 3-jaw chuck holds drills up to ½ in. Entire length, 28 in. Price $21.50.

No. 1003. One speed, 3-jaw chuck holds drills up to ¼ in. Entire length, 18¾ in. Price $13.00.

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Write for free booklet that shows and describes all the famous "Yankee" Tools.

NORTH BROS. MFG. CO., Philadelphia, U. S. A.

"YANKEE" TOOLS

Make Better Mechanics

(Continued from Page 36a)

Carnegie Institute of Technology, Pittsburgh, Pa. Today, through its pioneering, and more recently by the impetus given by the United Typothetae of America, Carnegie Institute has maintained its status as the only institution of college rank offering a comprehensive course for printing executives.

With an increased enrollment of about thirty per cent in the day courses, with a substantial increase in its equipment, and with an enlarged floor space, the printing department is today one of the largest and most important divisions of the institution.

The institution has entered into an agreement with the United Typothetae to raise a fund of $225,000 for the purpose of endowing two chairs of printing at Carnegie Institute. The chairs of U. T. A. professor of printing and of head instructor of craftsmanship have been established and are occupied by David Gustafson and John C. Martin.

The growth of the printing department since its organization fifteen years ago, has been substantial and steady. Through the cooperation of manufacturers of printing machinery and friends in the printing industry, equipment has been added until the shops of the department are equipped to give thorough training in hand composition, machine composition, imposition, platen and cylinder presswork, bookbinding, and other phases of printing procedure. A teaching staff of experts in the different fields included in the course has been built up.

Of the 86 day students, more than half are enrolled in the regular four-year course leading to the bachelor of science degree in printing. The remainder are taking either the two-year course in craftsmanship, or short special courses transferred from the Indianapolis school of printing. In addition, the department is giving instruction this year to 103 night students, most of whom are employed in branches of the printing industry in Pittsburgh.

Vocational Work in Florida. The present status of vocational work in Florida is given in the following statement of the number and types of schools and classes. There are 11 home-economics classes with 11 teachers, and also evening classes; 7 centers for part-time trade- and industrial-training centers; 12 day-trade classes with 12 teachers, and 35 evening trade-extension classes, with 35 teachers. Florida spends more than $3 for each Federal dollar appropriated to the state for vocational education.

Status of Vocational Work in Indiana. For the year ended June 30, 1927, Indiana expended $1,320,000 for vocational education. The Federal government supplied $195,000 of this amount, the state funds totaled $245,000, and the remaining $880,000 were paid from local funds. One half of the total expenditure was for agriculture, while one third was for trades and industry.

New Shops at Oklahoma City, Okla. The new bond issue of Oklahoma City includes an appropriation for new shops in the Central High School, which is to be converted into a technical and vocational school.

Progress of Vocational Education in Oregon. Oregon has a total of 54 centers where some form of vocational education is carried on in the fields of agriculture, industry, and homemaking. The apprentice school in Portland is second to none and is a cooperative effort of the employer, the employee, the state and Federal governments, together with the local school system.

The most recent developments have been the addition of a farm-shop course for farmers, a state program of training for locomotive engineers, and cooperative nutrition classes for mothers.

Vocational Work Expanded in Texas. All phases of vocational work in Texas have been expanded this year, due to the state's matching Federal funds, which gives over $700,000 for all phases of the work.

In trade work, the part-time and evening-school program is being promoted above the day trade-preparatory course, because it reaches the worker. Foreman training has been successfully carried out in the oil industry to such an extent that there is a great demand for foreman conference-leader courses.

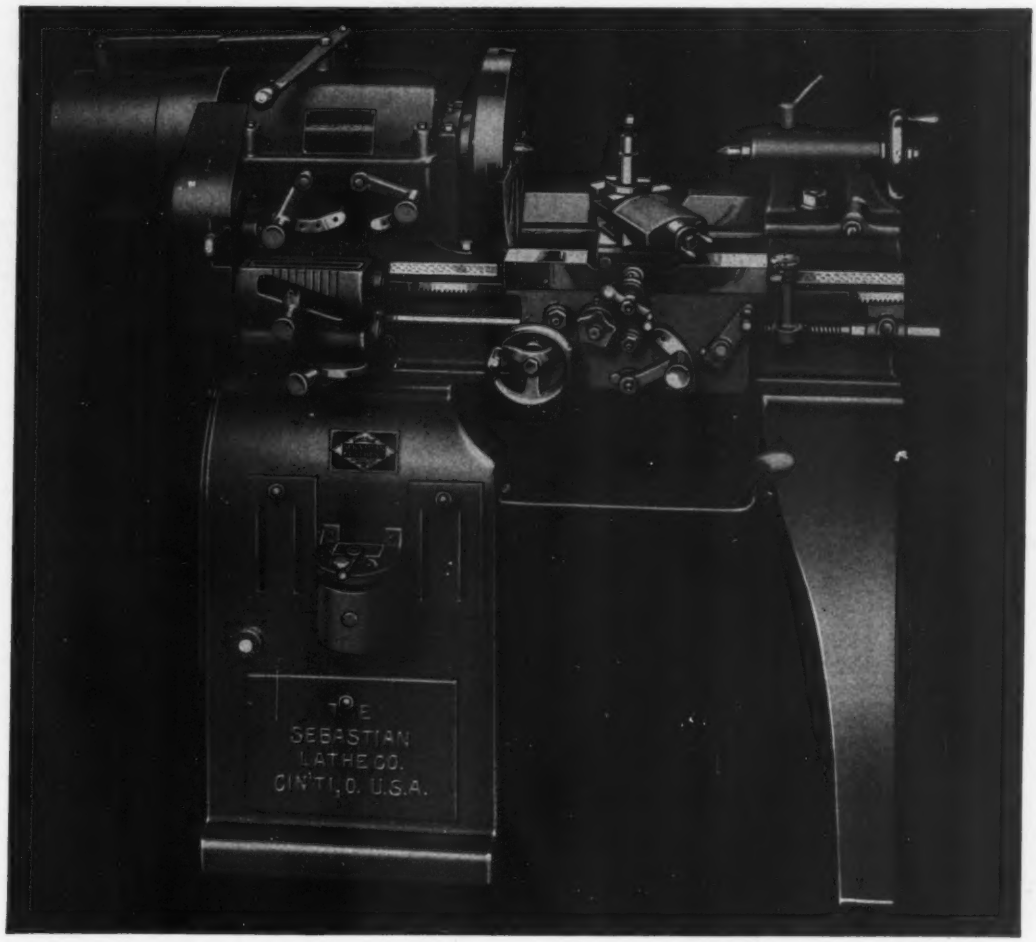
Trade Scholarships for New York Vocational Teachers. The Division of Vocational and Extension Education of the New York State Educational Department has announced a number of $1,000 scholarships, which are open to experienced trade workers desiring to become vocational teachers. The holders of the scholarships are required to attend classes in the industrial teacher-training department of the State Teachers' College at Buffalo, for ten months, beginning next September.

The scholarships will be offered to workers in the trades of automobile repair, electrical construction, bricklaying, jewelry manufacture, lithography, painting and decorating, mechanical drafting, architectural drafting, cabinetmaking, patternmaking, photo-engraving, plumbing, printing, sheet-metal work, shoe manufacture, watch repairing, weaving, power-machine operating, clothing designing, and novelty and flower work.

(Continued on Page 40a)

THE NEW 11-inch GOLD SEAL HEAVY DUTY LATHE

Reduces Breakage and Wear to a Minimum
Is as Precise as the Finest Tool Room Lathe



3-4-5-6 Foot Bed Lengths

During recent demonstrations to school officials this new lathe was submitted to amazing overload and break down tests. It demonstrated beyond a doubt that a lathe particularly suited to school shop requirements is now available.

DETACH AND MAIL COUPON IN ORDER
TO ACQUAINT YOURSELF WITH COMPLETE DETAILS
OF THIS NEW LATHE.

The Sebastian Lathe Company
Cincinnati, Ohio

See our Lathes being used by Students at the Parents' Exposition, Grand Central Palace, New York City, April 21-28, under auspices Board of Education.

Coupon

The Sebastian Lathe Co., Cincinnati, Ohio.

Send descriptive Bulletin of your New 11-inch Lathe.

Name.....

Position.....

St. & No.....

City..... State.....

IAM-5

Irwins

Make your Job Easier

It's one thing to tell a boy to bore a smooth, clean hole—but it's another for him to do it, if the bit he is using isn't designed for smooth, clean cutting.

Most boys take considerable pride in their finished work—that's what holds their interest. And you can do much towards maintaining their interest by providing proper tools.

For manual training and industrial arts classes, the Irwin Auger Bit with Mainbor cutting head has no equal—it has been designed for this type of work. It is fast cutting and bores a smooth, clean hole. It is a bit that boys will delight in using.

For manual training use, a special set of thirteen bits ranging in 16ths of an inch from ¼ inch to 1 inch is available.

Irwin's are the type of tools that help develop master craftsmen. Try them and see what a difference they make.

The IRWIN AUGER BIT COMPANY
Wilmington, Ohio.

IRWIN
Auger Bits

(Continued from Page 38a)

Vocational Courses at El Paso, Texas. A survey was recently made of the various trades and occupations of El Paso and the vocational courses offered have been planned to give the students the training necessary for their entrance into the more desirable occupations. The courses offered, while they do not include all the desirable occupations, are the ones which the schools have been able to offer during the year. These include machine-shop practice, printing, linotype operation, auto mechanics, auto ignition, carpentry, building construction, millwork, cooking or household service, dressmaking, power sewing, commercial courses, and nurses' classes.

The day trade schools are open to boys and girls not less than 14 years of age. They must take a regular course of studies to cover the trade they desire to learn.

The part-time schools are open to boys and girls not less than 14 years of age.

The night schools are open to all students not less than 16 years of age, who are engaged in some trade, business, or work for a living. Afternoon classes offer instruction in dressmaking and millinery.

Wages and Employment of Continuation Pupils at Brooklyn, N. Y. Mrs. Marie Holl, in charge of placement work at the Brooklyn Continuation School, states that each month hundreds of boys attending the school are placed in new jobs. The wages range from $8 to $17 a week. As part of the placement program, the school has a class in occupations to which are assigned all unemployed pupils. These pupils are tested and given instructions about opportunities in the labor market, and are taught the requirements, advantages, and disadvantages of different lines of work.

According to Mrs. Holl, the boys hold every sort of job that young workers under 17 years are engaged in, from the unskilled messenger and errand jobs, up to apprentices in the various trades, stock boys in retail and wholesale concerns, office boys, and clerical workers. A great many jobs are created by the placement workers especially for the special cases referred by the teachers as misfits in their present jobs, or for the applicants who desire the more unusual jobs, like an opening in an art department or an editorial department.

The employment workers and the teachers visit the places where the pupils work to see how they progress, what are the chances for advancement, and what the physical conditions are under which they work.

The placement bureau gives tests to those applicants who aspire to office work and a booklet is issued to each applicant for his own information. The booklet contains information about the labor laws, working-paper regulations, seasonal work, requirements in the main occupations, and advice on how to obtain work, how to approach the employer, how to hold a job, and how to advance.

Jewelers' Art Institute Opens in New York City. The Jewelers' Art Institute opened its new school of jewelers' trades on March 1, in New York City. The school is the outgrowth of the Brooklyn Jewelry Trades School, the Gem Arts Institute, and the Jewelry Arts Institute.

The courses to be taught will include stone setting, engraving and carving, clock and watch repairing, and jewelry repairing.

Vocational School at St. Louis, Mo. A vocational building will be erected for the Normandy district in St. Louis. The building, which will be two stories in height, will be of fireproof construction. The shops will be on the ground floor, the commercial and domestic-art departments on the second floor, and a cafeteria will occupy the ground floor of the center pavilion.

County Vocational School at Middleburg, Pa. The first agricultural vocational school in Snyder county has been established at Middleburg, Pa. In centralizing the agricultural instruction in the county seat, the way is left open for centralizing industrial-arts work in Selinsgrove.

Boy Farmers in Idaho Win U. P. Prizes. Fifteen Union Pacific scholarships of $100 each have been won by Idaho farm boys for outstanding work in vocational agriculture and supervised home project work. The scholarships become effective when the students enroll in the University of Idaho College of Agriculture.

Vocational Work for Teachers Offered in Texas University Summer Course. Courses in industrial education will be offered during three weeks of the summer session of the University of Texas. The courses are intended to meet the needs of the vocational teacher and foreman in industry who desire to obtain the required eight units for the vocational certificate and who cannot attend the long session of the University.

Establish Joint Vocational School in Loganton, Pa. Three districts of Sugar Valley have united in establishing a joint vocational high school in Loganton Borough. It is expected that the school will be ready for use by September, 1928.

Complete Study of Trade- and Industrial-Teacher Training in 1926. A research study recently conducted by Dr. Melvin S. Lewis, of Indiana University, deals with the problem of training trade and industrial teachers as it is practiced throughout the country.

(Continued on Page 43a)

Originated by NIAGARA

New Combination Bench Machine

for TURNING
BURRING
WIRING
ELBOW EDGING

Particularly adapted for use in the school shop. Hundreds now in practical use.

Sold complete with nine faces including one pair burring faces—extra upper burr face—two pairs turning faces—one pair wiring faces — gauge — wrench and bench standard.

(No. 10 Elbow faces $2.00 pr. extra) **$23.00**

NIAGARA MACHINE & TOOL WORKS
Est. 1879
637-697 NORTHLAND AVE. BUFFALO, N. Y.

EQUIPMENT FOR THE SHEET METAL SHOP

(Continued from Page 40a)

The purpose of the study has been to determine the status of the work of training shop teachers under cooperative relationships between the Federal board and the several state boards for vocational education. While the study was concerned primarily with the year 1926, statistics showing the results of practice in recent years were presented for purposes of comparison.

The program which has been recommended, as a result of the study, includes a number of important features which relate to training in resident and extension courses. Among other things, the program calls for a curriculum adapted to the training of trade and industrial teachers. This curriculum should offer a course in the organization and administration of vocational education; a course dealing with the methods of teaching trade and industrial work; a course dealing with occupational analysis; a course in which the prospective teacher teaches shopwork under adequate supervision; and a course dealing with class or shop organization, management, records, and reports.

Dr. Lewis' study will be published by the research division of the California State Education Department.

Eighteen Thousand Pupils Placed in Positions in New York City. Nearly 18,000 continuation-school pupils in New York City were placed in positions during the year ended June, 1927. Placement departments in continuation schools are commencing to find it much easier to obtain the right employment for children with vocational training.

Fourth-Year Work Added at Milwaukee Girls' Trade School. Permission has been given for fourth-year (twelfth grade) work at the Girls' Trade School, Milwaukee, Wis. With the adding of this work, pupils of the school are required to carry at least one trade subject in each semester's work.

Tuition for Continuation School. The Department of Vocational Education of Massachusetts has approved a tuition rate of 25 cents per hour of service for nonresident pupils attending the Boston continuation school.

Open Betsy Ross Prevocational School for Girls in Chicago. The Betsy Ross Prevocational and Junior High School for Girls has been opened in the former Flower High School, with an enrollment of 250 students. The prevocational department, comprising the 5th and 6th grades, has 75 pupils, and the junior high school has 164 pupils. The school serves a large district comprising the territory from 30th to 80th Streets.

Manual-Training Department Makes Cloak Racks. The boys of the Ogden School at LaGrange, Ill., have completed a number of cloak racks for use in the lower grades.

Open School of Radio Engineering at Ardmore, Okla. A school of radio engineering has been opened at Ardmore, Okla., as a part of the vocational-education program of the schools. The work is in charge of Mr. C. G. Whitchurch.

Cody Students Complete Shop Building. The students of the vocational department of the high school at Cody, Wyo., recently completed their farm-shop building, erected under the direction of Mr. Paul Sweitzer.

The building of the shop was one of the projects of the year, and every phase of the construction was checked by the class, including the work of drawing the plans, estimating the cost of the job, and planning and carrying out the work. Mr. Fred Gail, a local contractor was employed to assist in the structural work which gave the students the benefit of professional supervision. The building is 24 by 50 ft. in size, is stuccoed on the outside, and is provided with a good lighting system.

Fitchburg Eliminates Manual-Arts Work Below Ninth Grade. In order to effect a reduction in school costs to meet a reduction in school appropriations, the school board of Fitchburg, Mass., has eliminated manual-training, cooking, and sewing classes below the ninth grade. The city schools have accepted a reduction of $56,000 in the annual appropriations to meet an economy program of the city authorities.

Manual-Arts Exhibit at New Albany, Ind. An exhibit of manual-training and domestic-science work was held on March 17 at the high school, New Albany, Ind. The exhibit included cooking, sewing, and woodwork.

Addition to Vocational School at Paterson, N. J. The board of trustees of the Paterson vocational school has asked the city authorities for $110,000 for the erection of an addition to the school. The granting of the request is dependent upon the condition of the finances.

Add Course in Manual Training. The high school at Okaton, S. Dak., has equipped a room for manual-arts work. The course includes work in mechanical drawing and woodwork. Mr. F. M. Sandy is director of the work.

(Continued on Page 44a)

Six Day Classes
Two Night Classes

The Only Table
That Will Do the Job

Recently one of the new High Schools in one of America's greatest cities was in need of a Drawing Table that would accommodate six day classes and two night classes. They found this Kewaunee No. 205 was the only table available that would satisfactorily serve their purpose.

This Table provides private compartments for the equipment of eight students. As will be observed by the illustration, three perpendicular lockers open in the front, while three similar ones open in the rear. Each compartment will hold a 22 x 28 drawing board, a large set of instruments, scale, triangles, ink, detailed paper, etc., with a slot for a 24-inch T square. It puts everything of the student under individual lock and key except text books. Locks may be our standard master-keyed cabinet, or padlocks if desired.

These Tables are being installed in many schools to take the place of old drawing tables and wall cases. They eliminate confusion and increase efficiency.

This Table will meet all the requirements of the average high school or university.

We are manufacturers of a very complete line of Art and Mechanical Drawing Tables. Write for our complete Book of Illustrations.

Kewaunee Mfg. Co.
LABORATORY FURNITURE EXPERTS

Designers and Manufacturers of Art and Mechanical Drawing Room Furniture for Schools and Colleges

KEWAUNEE-ECONOMY PLANT No. 2
ADRIAN, MICH.

Kewaunee

(Continued from Page 43a)

Manual Arts Adopted at Millheim, Pa. An elective course in manual training has been introduced in the high school at Millheim, Pa. The course includes shopwork for boys, and needlecraft for girls.

Vocational Men of Southern Region to Meet at Charleston. The Southern Region of State Directors, Supervisors, and Teacher Trainers of Vocational Agriculture and Home Economics will meet at Charleston, S. C., early in 1929. The principal topic of discussion at the meeting will be the status of cotton. A special study of the cotton problem is to be undertaken by a committee previous to the next meeting.

Montana to Receive Additional Vocational Funds. Montana will receive about twice as much money for vocational education from the Federal government under the provisions of the George bill now before the senate. All funds appropriated under the bill are to be used solely to extend the training prescribed in the Smith-Hughes law. The bill authorizes appropriations of additional funds that will make it possible for additional rural districts to offer the practical type of training in their schools so essential to the welfare of the country. The bill provides an appropriation of $500,000 for the fiscal year ending June 30, 1929, and for each year thereafter for eleven years, a sum exceeding by $500,000 the amount appropriated for each preceding year, and annually thereafter there is authorized to be appropriated for each year $6,000,000.

New School of Commerce in New York City. The board of estimate of New York City will shortly approve the contracts for the construction of the new building for the School of Commerce of the College of the City of New York. The building will be nine stories in height and will be completed ready for occupancy in February, 1929.

New Vocational School at Muncie, Ind. The school board of Muncie, Ind., has approved plans for a vocational school, to cost $235,000.

West Allis Vocational School Dedicated. The vocational school at West Allis, Wis., was dedicated on March 9, with a dedicatory program. The dedication marked the completion of the first two units of the structure.

Industrial School for Boys to be Established in Philadelphia. Under the will of the late Rodman Wanamaker of Philadelphia, a trust fund of $2,000,000 has been provided for an industrial school for boys, to be known as the John Wanamaker Free School of Artisans. The school is to be erected and equipped with the income from the trust fund.

Boys Construct Davenport and Tea Tables. The boys of the manual-training department at Crystal Falls, Mich., have completed davenport extension and tea tables which were made in the school shop. The remainder of the school term will be devoted to the making of cedar chests, and to upholstery and overstuffed work on chairs and stools.

Will Offer Summer Course in Printing at Kansas State College. The value of printing as a vocational and trades study will be stressed in a special group of courses for printing teachers and supervisors at the Kansas State Teachers' College, Pittsburg, this summer. The course will cover nine weeks and will be conducted under the direction of Prof. Ralph M. Coffelt, director of the printing department of the college.

The purpose of the course is to furnish a background in printing for supervisors who are not printers themselves, and to offer thorough training in the pedagogy of the subject to teachers already at work. While the regular courses in the art of printing will be conducted as formerly, it will be the aim to stress the new course for the benefit of the printing teachers' profession.

The course will be conducted as a seminar. The subjects treated will include trade analysis, organization of courses of study, methods of teaching, lesson units, equipment, and professional relations.

Girls' Trade School in New York City. Plans are being completed for the Bronx Vocational School for Girls, in New York City, which is to be opened in September. The school will be housed in the former School No. 1, in the Bronx.

Install Equipment in Industrial-Arts Building at Morgantown. The industrial-arts building of the high-school group at Morgantown, W. Va., has been provided with mechanical-drawing, woodworking, auto-mechanics, and electrical equipment, at a cost of $20,000. The school board plans to equip the printshop, agricultural laboratory, and sheet-metal shop as soon as possible. All the shops and laboratories are concentrated in a special unit constructed for this purpose.

New Vocational School in New Jersey. A two-story vocational school will be erected in Pensauken township, Camden county, New Jersey. The building will contain five shops and will be erected from plans prepared by architects Lackey & Hettle, of Camden.

Nine New Farm Courses Established. Nine new departments of vocational agriculture have been established in high schools of North Dakota this year. The schools are located at Alexander, Hankinson, Hillsboro, Mandan, Ray, Rolla, Starkweather, and Wahpeton.

(Continued on Page 46a)

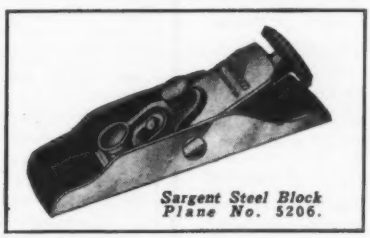
Sargent Adjustable Iron Bench Plane No. 411.

Sargent Auto-Set Bench Plane No. 711.

Sargent All-Steel Block Planes offer many advantages for the manual training class . . .

FOR many reasons we recommend steel block plane No. 5206 to the manual training instructor. It is small and light, practically indestructible . . . excellent for use either where tools are punished by beginners or finely used by advanced and careful students.

It is intended particularly for end work and it fits into many of the usual jobs of finishing. Like all other Sargent planes, it has a thin, tough chromium steel cutter that will cut through the toughest woods, and will keep its edge unusually long. This cutter is held in place by a powerful screw clamp which takes the place of the cam generally used on block planes. A large screw in the back of the plane allows for rapid up-and-down adjustments, and serves as a handle by which to push the plane.



Sargent Steel Block Plane No. 5206.

For general use and in work that cannot be efficiently performed with the block plane, you should buy Sargent Auto-Sets, the "700" line. Modern, easily adjusted, light, strong and solid, with an automatically set cutter, they are the finest planes you could use. If you prefer the old-style planes, we offer the Sargent "400" line as equal to any other on the market. All of these planes are made with the same fine care and thoroughness which goes into every Sargent product.

Ask your dealer to show you these Sargent planes. And at the same time have him show you Sargent squares and clamps. Write us for catalog and further particulars. Sargent & Company, Hardware Manufacturers, 58 Water St., New Haven, Conn.

SARGENT

Tools & Hardware

Sheldon Drawing Tables For All Sizes of Classes

DRAWING is one of the most important subjects in a high school curriculum; its application is universal. The real estate man must lay out additions and read maps; the lawyer must diagram accidents and crimes; physicians and dentists must chart the body and the teeth; the cabinet maker, the carpenter, the metal worker—all require a knowledge of drawing.

We build drawing tables to accommodate from one to eight students, with private lockers for the drawing boards, portfolios, and instruments belonging to each individual student. By having the lockers in the table, time is saved in opening and closing classes and the greatest efficiency secured.

Sheldon drawing tables are made of heavy material bolt re-enforced—they will stand up under the hardest conditions for a lifetime. The material used is twenty per cent heavier than that used in ordinary drawing tables.

Send for our complete catalog of drawing tables and manual training benches.

E. H. SHELDON AND COMPANY
Laboratory, Home Economics and Vocational Furniture
MUSKEGON, MICHIGAN.

(Continued from Page 44a)

New Trade School for Girls in New York City. The new vocational school for girls in Bronx Borough, New York City, will be opened at the beginning of the fall term in 1928. This will be the first trade school for girls in the Bronx Borough and will attract an enrollment of about 360 girl students, who will receive instruction in dressmaking, millinery, novelty work, power-machine operating, and art weaving.

The new school will fill a great need in the Bronx Borough as girls residing in this section have been compelled to apply at the Manhattan Trade School for Girls. Each year an increasing number of Bronx students have been denied admission because of lack of accommodations. Last year several hundred girls from the Borough were refused admission because of overcrowded conditions.

The school will open with an initial organization of 360 students and a staff of sixteen teachers. The school will be administered by a teacher in charge until the enrollment reaches a point where it demands the appointment of a regular principal.

New Course of Study for Continuation Schools of Pennsylvania. Dr. Keith, state superintendent of public instruction for Pennsylvania, has appointed a state committee which has been given the work of rewriting the course of study for the continuation schools. The committee comprises Harry K. Balsbaugh, Harrisburg; Anthony M. Goldberger, Pittsburgh; Carolina M. Reedy, Reading; and William H. Welsh, Philadelphia.

Sixth-District Agricultural School. The Sixth-District Agricultural School at Barnesville, Georgia, was established as a school of agricultural and mechanical arts and is conducted in cooperation with the Smith-Hughes law. The school aims to train boys and girls for useful lives in the various phases of farm and home life. The school has a shop building which houses the blacksmith shop and woodshop. The laboratory equipment is very complete and the farm furnishes an opportunity for the observation of the best methods of farming, for demonstration, and for practical experience in planning and managing a farm.

Vocational Building Completed at Oberlin, Kans. The Decatur County High School at Oberlin, Kans., has completed a vocational building, at a cost of $7,000. The building houses the classroom and shopwork.

Remodel Farm Shop at Abilene, Kans. The farm shop at Abilene has been remodeled and new equipment added.

Home-Economics Class Studies Home Interiors. The second-year girls of the home-economics class at Frontenac, Kans., recently completed a study of home interiors, including the arrangement of rooms and plans for remodeling. The study was of particular interest to the girls because their parents had talked of doing some remodeling in their homes. As a laboratory problem for the lesson in furnishings, the class tied a quilt, doing all the work of placing the quilt in the frames, laying the cotton, tying, removing from the frames, and finishing of the edges.

Issue School Bulletin at Chanute, Kans. The Chanute city schools of Chanute, Kans., are issuing a trade-school bulletin which is devoted to information about the trade school.

Show-Card Class at Salina, Kans. The show-card class at Salina, Kans., recently completed the preliminary work in lettering practice and is now making window cards. During the balance of the course, the emphasis will be placed upon layout and design. The local professional card writers frequently give talks to the class on layout, balance, and design.

Class in Show-Card Writing Organized. A class in show-card writing was organized shortly before the holidays at Newton, Kans., in order to supply the demand for cards at Christmas. The schedule called for two six-week periods, with another six weeks in the spring provided the demand continued.

Kansas Industrial-Arts and Vocational Association to Meet in Topeka. The Kansas Association will hold its next annual meeting next November, in Topeka.

Compensation for Vocational and Industrial Teachers. The board of education of New York City has approved a recommendation that substitute teachers of vocational or industrial subjects in continuation schools be paid at the rate of $7.80 per day, these rates to take effect during the school year 1927-28.

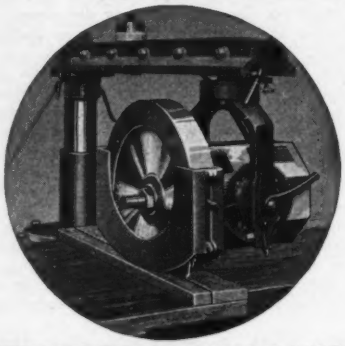
Will Determine Status of New York Continuation Schools. Supt. W. J. O'Shea of New York City, has asked State Commissioner F. P. Graves to clarify his recent decision classifying continuation schools in order to settle definitely the eligibility requirements for continuation-school licenses. Subject to the approval of the state commissioner, the city school officials recommended that certain of the requirements be waived so as to render all teachers with one year's satisfactory service eligible for the examination for continuation-school licenses.

Regarding the status of continuation-school teachers, it is desired to know whether the rule means the equivalent of high-school grades in all respects. In his decision the commissioner classified the educa-

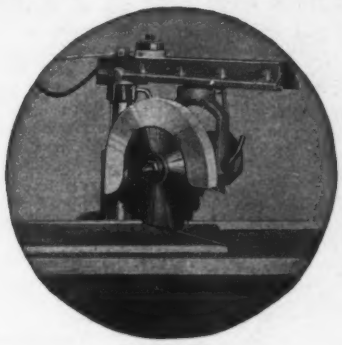
(Continued on Page 48a)

Instruct your students on a DeWalt

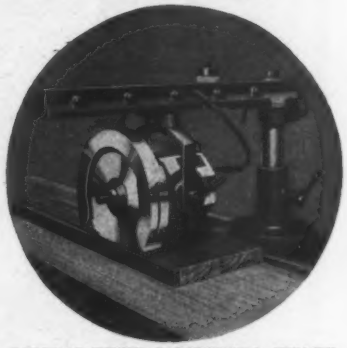
—the ideal machine for elementary or advanced training



CROSS-CUTTING WITH SCHOOL GUARD



MITERING



RIPPING WITH CALIFORNIA GUARD

PLOUGHING

With the general trend toward more practical instruction—training that most nearly conforms to conditions found out on the job—the DeWalt is finding increasing favor among schools who provide woodworking instruction. Whether your classes are for elementary training or for the most advanced work, you will find a DeWalt the ideal school shop machine.

SAFE

Simple, rugged construction makes the DeWalt in itself a safe machine. But in addition there is a special school guard that provides 100% safety in every cutting position—another guard that removes 90% of the sawdust when machine is ripping—and a special end shield guard that eliminates all possibility of operator's clothing becoming entangled in mandrel shaft.

ACCURATE

The overhead construction means work lies flat with the layout marks always clearly in view. A graduated dial on the side of the motor insures accurate angles on all bevel cuts. A scale gauge on the arm locates rip distances. A calibrated head locates any miter adjustments with quick locating lugs at 90° and 45°. Every adjustment has a positive locking arrangement.

PRACTICAL

The DeWalt provides for complete woodworking training — a single machine that does a variety of wood-cutting operations. Used in all branches of woodworking—building, planing mills, lumber yards, industrial plants, etc. — the DeWalt is an unusual machine that is practical for both industrial use and student training.

Train your students on the DeWalt — the machine they will most likely find on the job when they go to work.

ARRANGE FOR DEMONSTRATION

We will be glad to send you more complete particulars and to arrange for a demonstration of this remarkable all purpose wood worker in your school shop.

SHAPING

BEVEL CROSS-CUTTING

DADOING

AMONG THE MANY SCHOOLS NOW USING DeWALTS:—

Catholic University	Washington, D. C.
Mass. Inst. of Technology	Boston, Mass.
Port Arthur Indp. School Dist.	Port Arthur, Tex.
Penna. State College	State College, Pa.
Hampton Institute	Hampton, Va. (2)
St. Scholastica Academy	Chicago, Ill.
Oakdale School	Swarthmore, Pa.
Missionary College	Tacoma Park
L. M. Hartley, Supt. of Indus. Arts	Mountain Iron, Minn.
Redemptionists' Fathers' School	Oakland, Cal.
Sacred Heart Novitiate	Los Gatos, Cal.
Indiana School for Epileptics	New Castle, Ind.
State College of Washington	Pullman, Wash.
University of Pittsburgh	Pittsburgh, Pa.
Utica Free State Academy	Utica, N. Y.
State Normal School	Mansfield, Pa.
Tredyffrin Easton High School	Berwyn, Pa.
State School for Deaf and Dumb	Trenton, N. J.
Oregon Agriculture College	Corvallis, Ore.
City of Indianapolis	Vocational Depot
Darby High School	Darby, Pa.

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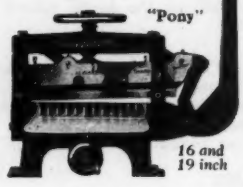
School Name.....

Address.....

"Pony"



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Advance Lever Paper Cutters are made in four sizes, from the 16- and 19-inch "Pony," with or without iron stand, to the sturdy 26½- and 30½-inch sizes illustrated above.

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Sieber Adjustable Hand Punch
Challenge Proof Presses
McGreal Combination Printers' Chases
Challenge Labor-Saving Iron Furniture
Challenge Mammoth Iron Furniture
Challenge Notched Iron Furniture
Challenge Semi-Steel Imposing Surfaces
Challenge Pressed-Steel Galleys
Challenge Rigid-Rim Galleys
Challenge Iron Sectional Blocks and Hooks
Challenge Type-High Gauges
Challenge Quoins and Keys

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GRAND HAVEN, MICHIGAN

Chicago, 17-19 E. Austin Ave. New York, 200 Hudson St.

(Continued from Page 46a)

tion given in continuation schools as secondary education. Principals and teachers in these schools claim, that because of the decision, they should receive high-school salaries.

Day Classes for Building Apprentices in New York. The New York City board of education has entered into an agreement with the building-trades union for the organization of day classes for apprentices in the bricklaying and plastering trades in the Building Trades Continuation School.

Under the plan, the apprentices in the building trades will attend school eight hours every other week. During their attendance, the apprentices will be paid their regular wages by their employers. The program calls for four classes each week, with each teacher in charge of a class of thirty apprentices, making a total of 120 per teacher per day.

The employers estimate that it will cost approximately $35,000 annually for the time the apprentices are in school.

New York Evening Schools Offer Training in Variety of Occupations. Instruction in 150 different occupations is offered in the evening trade classes of New York City. The increasing insistence of trade unions that apprentices avail themselves of the evening instruction for trade classes has resulted in a rapid expansion of the work.

Vocational-Guidance Work at Bloomfield, New Jersey. Vocational-guidance work is being successfully conducted at Bloomfield, N. J., with the result that students have a better understanding of their abilities in the line of future careers. The work includes a survey study of occupations in the community, a series of vocational conferences, and an analysis by the student of at least one vocation. A few questionaries and tests are used, but most of all a thorough acquaintance with the student is relied upon, in which the counselor becomes a real friend. At the conclusion of the course, the student prepares a paper on the particular vocation which looks most favorable to him. In cases in which the student is unable to reach a definite decision, he writes about any one of several vocations. After graduation, a follow-up card is sent to each graduate with a view of obtaining a few vocational facts about the student. The cards are later used in making up records of what graduates are doing and in locating those who may be interested in new positions.

New Trade School at Nappanee, Indiana. The Indiana tax commission has approved a tax levy which is to provide funds for the erection of a trade school at Nappanee, Ind.

Radio Service Course at Essex County Vocational School. A course for training radio-service men has been added to the courses being offered in the Essex county, New Jersey, vocational school at Newark.

Vocational School at Columbus, Georgia. A school for vocational education has been opened at Columbus, Ga., under the auspices of the local board of education and the chamber of commerce. The school is being conducted in the auditorium of the chamber of commerce and is financed by state and federal vocational funds.

Vocational Class in Salesmanship. A class in salesmanship has been organized at the Brewster Vocational School at Tampa, Fla. The course, which will be free, will be in charge of Mr. C. P. Peters.

Vocational Students Taught Various Trades at LaCrosse. Trade and industrial training is part of the broad course of study being offered to boys in the part-time, half-time, and full-time departments of the vocational school at LaCrosse, Wis. Among the subjects taken are cabinetmaking, auto mechanics, electricity, printing, sheet-metal work, and machine-shop practice. The half-time students are given an opportunity to work in each of the departments of the school, and at the end of the period of time are allowed to enter the department which they have selected as their lifework. The boys of the part-time division are given the same opportunity.

Students Enrolled in Electricity Class at Neenah. Six students have been enrolled in the class in electricity organized at Neenah, Wis., under the direction of Mr. Clyde Cavert.

Mechanics Institute Seeks Endowment Fund. A campaign has been started to raise an endowment fund of $3,000,000 for Mechanics Institute at Rochester, N. Y. The campaign was begun following a survey of the institution and its work by a special commission appointed for the purpose. The commission reported that the institution is doing a remarkable educational work and that it should continue its work as an independent agency, in order to meet the increasing demands for training students for industry and for the home.

Pueblo Boys Make Filing Cabinets. The boys of the manual-arts department in the Central High School at Pueblo, Colo., recently completed cabinets for filing records in two of the school offices. The cabinets are fully up to the standard of the commercial article and have been constructed at a great reduction in cost.

Trade Students Allowed Part of Cost of Transportation. Students in Connecticut between 14 and 21 years of age who are

(Continued on Page 51a)

(Continued from Page 48a)

attending a state trade school outside of the town in which they reside, are allowed 50 per cent of the cost of transportation to and from school, not exceeding $35 per year.

Establish Automotive Shop in Los Angeles. An automotive shop for mentally retarded pupils has been established at Los Angeles, Calif. Courses will also be offered in baking and candy making, laundry work, furniture construction and painting, auto mechanics, polishing and painting, vulcanizing, plumbing, foundry work, cobbling, cement work, and allied subjects.

New Home-Economics Practice Department. A practice apartment has been added to the home-economics department of the William Penn High School, Harrisburg, Pa. The girls in the classes planned the decorations, as well as the equipment for the rooms of the apartment.

Homemaking Cottage at Shickshinny. A homemaking cottage has been erected for the home-economics department at Shickshinny, Pa. The cottage is located on the school grounds and has been planned to meet the needs of the vocational home-economics classes.

New Vocational Schools in Pennsylvania. Five new vocational schools and one vocational department of agriculture were started this fall in Pennsylvania. The vocational schools are at Charleston and Liberty in Tioga county; Thompson in Susquehanna county; Mt. Pleasant township in Wayne county and Schwenksville in Montgomery county. The vocational department is at East Greenville, Montgomery county.

New Project Completed at Johnstown, Pa. The boys of the Johnstown Continuation School, under the direction of two instructors, recently completed the project of moving a cooking laboratory from a grade school to a continuation school. The laboratory is now in use at the continuation school. The boys enameled all the equipment, including the cupboards, tables, and stools. The girls prepared and arranged the sash curtains and food charts.

Manual-Arts Equipment Moved to New Building. The manual-arts equipment of the old Garfield vocational school was recently moved to the new Garfield Junior High School, Johnstown, Pa., which was opened last fall. A number of new and modern pieces of machinery have been added. The battery of shops includes mechanical drawing, electrical construction, metal work, auto-mechanics, machine woodworking, joinery, and printing.

Retail Cooperative Plan at Lancaster, Pa. Eighteen high-school girls have been enrolled in the retail cooperative training course at Lancaster, Pa. The course was begun in response to a request of the retail stores and the local chamber of commerce and forms the laboratory where retail selling experience is gained. The classroom is used to analyze and to discuss experience. A definite minimum per-week wage is paid to cover the time spent at work in the store.

New Automotive-Trades School. The board of education of Cincinnati, Ohio, has purchased a site for a new building for the automotive-trades school. The new building will be modern in every respect and will meet the needs of every department in the school.

Shop Teachers at Pueblo Wear Smocks. Smocks have been adopted by the eight shop teachers in the Central High School, Pueblo, Colo., in order that they may be protected during the performance of their duties. The garments are made of acid-proof, chemically treated cloth in three-quarter length and are gray in color.

Industrial Survey of Trenton. Upon the recommendation of Supt. W. J. Bickett of Trenton, N. J., a survey of the local industries was recently conducted as a means of developing policies and formulating a program of vocational education. The various industries have been analyzed as a means of determining the needs and possibilities of training workers in different occupations. The survey was conducted by Dr. G. C. Gamble.

Analysis of Benchwork Units. The class in shop organization at the Western State Teachers' College, Kalamazoo, Mich., recently analyzed the subject of elementary benchwork, dividing it into units or divisions for teaching purposes. The units into which the subject was divided are as follows:

1. Shop conduct and dress
2. General care of tools
3. Measuring and marking
4. Sawing
5. Planing
6. Knife and gauge lines
7. Squaring to dimensions
8. Chamfering and beveling
9. Blue-print reading
10. Simple drawing
11. Getting out stock
12. Boring
13. Sanding
14. Simple drawing
15. Fastenings

(Continued on Page 55a)

"Standard Equipment" in Detroit

THE schools of Detroit have 15 printing departments equipped with Chandler & Price Presses.

How do they perform? "Splendidly," replies one Detroit school supervisor. "They do all one should expect—and more."

Are they any trouble? "No," answers the same school official. "Our students can easily care for and operate these machines. They are never out of order—*always* ready for use. The upkeep cost is virtually nil.

"Chandler & Price Gordon Presses are the only practical platen presses for school purposes. They are standard equipment in this city, as they should be everywhere."

(Detroit schools also use Chandler & Price Paper Cutters.)

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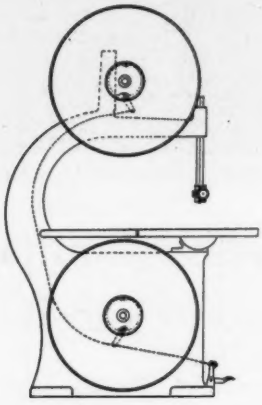
SCHOOL SHOP EQUIPMENT NEWS

For the Supervisor and Teacher who desires to keep abreast with news of new Machinery, Tools, Supplies, etc.

TANNEWITZ TWO-WHEEL BRAKES FOR BAND SAWS

The Tannewitz Works of Grand Rapids, Mich., manufacturers of the Tannewitz high-speed band saws, and other saws, have announced the marketing of a synchronized two-wheel brake for use on high-speed band saws.

The brake which is of the internal expanding type, is mounted inside the wheel hubs, and is lined with an asbestos brake lining. The brake is connected to a single foot pedal and is perfectly synchronized by means of a steel cable, inclosed in a grease-filled tube. The wheels may be stopped instantaneously by means of a slight pressure on the foot pedal.

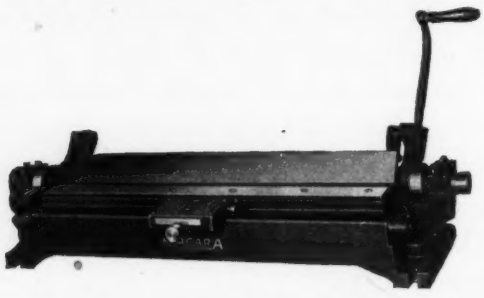


The device should prove helpful to the operator in a change of saws. The wheels which are of the direct motor-driven type, will revolve for a considerable time due to their ball-bearing construction. This feature should prove a safety device in the shop. It prevents a broken blade from trailing around the wheels, thus keeping a pupil from being injured by grasping a broken saw blade.

School-shop instructors, who are interested in this new device, should address the Tannewitz Works, at Grand Rapids, Mich.

NEW NIAGARA BAR FOLDER

The Niagara Machine & Tool Works of Buffalo, N. Y., has announced the marketing of the new Niagara bar folder. The folder is made in the 30-in. working length and weighs approximately 235 lb. It will handle locks from $\frac{1}{16}$ in. to 1 in. of 22-gauge material.



The folder is of the new box-frame type of construction. By careful designing and redistribution of metal, a folder has been secured which is a decided improvement over the older type.

The firm has announced the fourth edition of its Catalog, No. 56, illustrating and describing its line of sheet-metal tools and machines.

School-shop instructors who are interested in securing this catalog should address the Niagara Company at 637 Northland Ave., Buffalo, N. Y.

NEW IMPROVED PORTER-CABLE SANDER

The Porter-Cable Machine Company of Syracuse, N. Y., has announced the marketing of its new improved take-about sander for use on hand belt-surfacing machines. The machine is of the latest design and construction and is equipped with a wide roller which gives the machine perfect balance and makes it easy to operate.

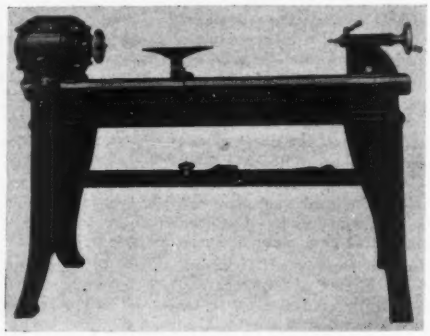
The entire frame of the machine, with the exception of the motor cap, is a one-piece aluminum casting and the motor cap and pulleys are cast from the metal. All parts, with the exception of the bronze and steel fittings, are of aluminum. The motor is of the universal type and may be operated on any alternating current. The power is transmitted to the rear pulley by means of a worm and gear which are totally inclosed, thus sealing the lubricant and keeping out dirt.

The sander is helpful in reducing tedious handwork in connection with the finishing or refinishing of fine table tops, desks, and other pieces of furniture and woodwork projects.

NEW UNION MOTOR-IN-HEAD, GALLMEYER & LIVINGSTON SPEED LATHE

The Gallmeyer & Livingston Company of Grand Rapids, Mich., has announced the marketing of a new Union motor-in-head speed lathe.

The machine which is built in three sizes, is equipped with a single-speed ½-h.p. ball-bearing motor for one-, two-, or three-phase alternating current, or for 115- or 230-volt direct current. In cases where only one machine is installed, two interchangeable motors can be furnished, so that in a few minutes' time a slow-speed motor may be replaced with a high-speed motor or vice versa. Where several machines are installed, it is possible to reduce the cost of the lathe installation by having part of the machines equipped with motors running at 3,450 r.p.m. and the rest at 1,725 r.p.m.



The three sizes of motor-in-head speed lathes swing work 26, 40, and 52 in., respectively, between centers. The machines handle work up to 12 in. in diameter over the bed, and up to 9½ in. over the toolrest. Heavy cast legs provide a rigid support to the bed, and eliminate vibration and furnish space for a shelf below the bed.

The motor is equipped with a perfectly designed, rigid, and accurately constructed tailstock, which may be located in position, or released from a fixed position by a turn of a special wrench. The tailstock spindle is $1\frac{5}{16}$ in. in diameter, and is bored for a No. 2 Morse taper. The spindle is held rigidly in place by a quarter turn of the lever provided for the purpose.

The toolrest, which is adjustable vertically, swings at any desired angle and may be moved to any point and instantly locked in position.

ISSUE BOOKLET OF PLYWOOD PROJECTS

The Algoma Panel Company of Algoma, Wis., has issued a booklet of plywood projects representing 46 prize-winning designs in woodwork submitted in their recent contest on woodworking.

The book has been issued as a means of educating the manual-training student in the manifold advantages of plywood as a woodworking medium, and to help him in learning its proper uses. The projects are limited to drawings only, since it was the belief of the Algoma Company that the teachers would prefer to work out the details of procedure in their own way.

KESTER
Self-Fluxing
SOLDER

Kester is a genuine solder of virgin tin and lead, free flowing, clean in operation and substantial in result.

"My boys learn to solder *in half the time*"

Such is the opinion of every teacher who has given his classes Kester Self-Fluxing Solder to work with.

No paste nor acid fluxes to bother with—difficult matters at best and needlessly hard for boys. Kester needs only heat, supplies just the right amount of the right flux automatically. The flux is in the solder, like lead in a pencil.

Boys you thought *could* not learn, will soon turn out workmanlike jobs with Kester. And they'll really enjoy doing it.

Sold by jobbers and dealers everywhere.

Try it out in your classes at our expense. The coupon will bring you a full supply of liberal samples, one for every boy in your classes.

CHICAGO SOLDER COMPANY, 4259 Wrightwood Ave., Chicago
Gentlemen: Please send the following number of working samples:
....Kester Acid Core Wire Solder ....Kester Rosin Core Wire Solder
The number of boys in our shops are: General..... Electrical.....
Sheet Metal..... Home Mechanics.....
Signed .....
Instructor in ..... School.....
City..... State.....

(Continued from Page 51a)

16. Grinding and sharpening of tools
17. Chiseling and gouging
18. Coping-saw and turning-saw work
19. Shaping and forming
20. Assembling of several pieces
21. Application of hardware
22. Simple upholstering
23. Study of woods
24. Supplementary problems

National Guidance Association Will Hold Meeting in Boston. The annual meeting of the National Vocational Guidance Association will be held February 23-25 at Boston, Mass. The headquarters for the meeting will be at the Statler Hotel and the subject for discussion will be "Harnessing Guidance and Personnel for Service in 1928."

Trade School for Yonkers, New York. Plans have been completed for an addition to the Saunders Trades School at Yonkers, N. Y. The building will be two stories high, and will be arranged to admit the maximum amount of light for work of this type.

Propose New Boys' Trade School at Pittsburgh, Pennsylvania. Mr. L. H. Turner, principal of the five vocational schools of Pittsburgh, in a recent report, traced the development of the vocational school in Pittsburgh from 1912 to the present time. Mr. Turner shows how the vocational system has grown from a school of eighteen pupils and five teachers in 1917 to the present time where the board has ordered the preparation of plans for a boys' trade school to cost $1,500,000. At the present time courses in fifteen trades are being offered to pupils in the vocational schools. These include auto mechanics, bricklaying, cabinetmaking, carpentry, patternmaking, foundry practice, electric wiring, electric power, telephony, machine-shop practice, mechanical drawing, plumbing, printing, sheet-metal work, and radio testing and repairing.

Propose Vocational School at Akron, Ohio. The board of education of Akron, Ohio, is seeking a site for the proposed vocational school.

Install Printshop at Union Vocational School, Schenectady, New York. A complete printshop has been established in the Union Vocational School at Schenectady, N. Y. The cost of the equipment will reach $1,751.

Organize Michigan Association of Manual-Arts and Industrial Teachers. At a recent meeting of the manual-arts and industrial-education teachers of Michigan, steps were taken toward the organization of a state association. A committee was appointed with power to proceed with plans for the organization. It is believed a state organization through its committees can show what the objective of the teaching should be.

Dr. Bobbitt Advocates Household Mechanics. In his address before the junior-high-school teachers of Detroit, Mich., Dr. Franklin Bobbitt pointed out that the tendency to hold to the primitive conception of subject teaching has prevented progress in the manual arts.

As one of the evidences of progress, Dr. Bobbitt cited the unspecialized activities now given a prominent place in the manual-arts courses for boys of junior-high-school age. The work for these boys used to be formal and bookish. Now the live manual-arts teacher in a home-mechanics course fits a boy for actual living in the home. The same is true of home economics and gardening. All of these help to modernize practical-arts training and thus get away from the old-fashioned subject teaching.

Manual-Arts Teachers of Negaunee Meet. The manual-arts and industrial teachers of Negaunee, Mich., met for their regular meeting in the Negaunee High School. Twenty men from Negaunee and vicinity were present. Mr. K. G. Smith of Lansing, discussed methods of grading drawings, shop tests, and the general problem of manual arts.

World Economic Conference on Agriculture. The World Economic Conference, held in May at Geneva, Switzerland, took up the economic problems of agriculture. It was the conclusion that the depression in agriculture is characterized by a disequilibrium between the prices of agricultural products and those of manufactured products and that the depression is aggravated in many countries by the difficulty of obtaining credit on normal terms. It was the opinion that it is necessary to increase agricultural production and that improvement might be accomplished through the adoption of technical improvement, the scientific organization of production and stockbreeding, improvement in marketing, and standardization of agricultural products. Agriculturists should find remuneration in regularity of prices and not in speculation.

It was agreed that there should be an international plan and agreement for a campaign against diseases affecting plants and animals. An exact system of farm accounting should be adopted.

(Continued on Page 56a)

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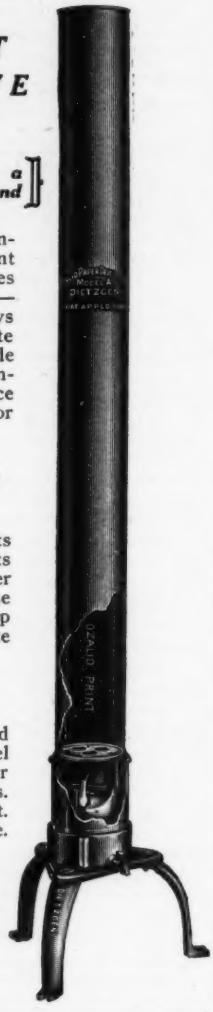

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(Continued from Page 55a)

The International Chamber Congress approved the adoption of scientific methods in agriculture and emphasized cooperation with the International Institute at Rome.

Manual Arts at Los Angeles, California. Extension courses in manual arts given under the direction of the Santa Barbara teachers, as authorized by the manual-arts department of the Los Angeles board of education have been organized at the Braun Building. Each course offers two credits toward a special teaching credential in manual arts. The work covers three class periods and one hour of home study each week and includes work in gilding and compo, foundations of woodwork, handwork for elementary schools, and industrial-arts design.

New Vocational Department at Long Beach, California. The new vocational department at Long Beach, Calif., has been placed in charge of Dr. Frederick A. Horridge. As director of this department, Dr. Horridge will conduct a vocational survey of Long Beach and the vicinity, preparatory to the organization of vocational courses. The new department has been made necessary because of the industrial growth of the city which has followed the development of the harbor.

Dr. Horridge goes to Long Beach after a varied experience in vocational work. For three years he was director of industrial work in the Santa Barbara Teachers' College, and later served four years as associate in education at the University of California. In 1925 Dr. Horridge received the degree of doctor of philosophy from the university; and for the last two years he had occupied the position of vocational director in the Ohio State University.

Helping Young Printers to Success. With a view of inspiring young men to become future leaders in the printing industry, Mr. Henry A. Wise Wood has asked the New York City board of education to accept annually the sum of $600, to be awarded in the school of newspapermen. The offer is the result of a visit of Mr. Wood to the school, where he gained a first-hand knowledge of the work being done in promoting vocational and educational opportunities.

Of the prizes offered, the sum of $150 is to be awarded to the graduate receiving the highest rating in scholarship. Individual prizes of $25 each are to be given for the best attendance record to the graduate receiving the highest rating in the final test. There will be three prizes of $75, $50, and $25 for the best ideas on the improvement of the mechanism in the newspaper press. Five prizes of $20 each will be given to the five students rated best in practical efficiency.

Mr. Wood has provided a series of magazines for the reading room of the school so that apprentices may make profitable use of their leisure time in reading. A shelf of recent publications in vocational pedagogy has also been provided for the teachers as a help in teacher training.

New Automotive-Trade School. The board of education of Cincinnati, Ohio, has purchased a site for a new automotive-trades school. The new building will provide adequate space for the automotive school.

Home-Economics Work at Effingham, Kans. Last fall the foods class at Effingham, Kans., canned 250 quarts of vegetables, fruits, and pickles. They have since entered upon a special study of school lunches, taking up the fuel value, cost, and management of lunches. In the related-arts class, the pupils have made lamp shades. In this work they applied the principles of design and worked out a number of color combinations.

Progress of Adult Education in Oklahoma City. Special classes in trade education and evening vocational work for adults are being offered at Oklahoma City, Okla., under the direction of Mr. H. S. Rusch, director of manual-arts work in the Oklahoma City schools. There are afternoon classes for women in sewing, mothercraft, and millinery and there are also special classes held in schools, in community houses, and private residences for the benefit of those women who live in districts far away from school buildings. The home-economics department of the night school offers 29 sewing classes, 4 handcraft classes, 13 millinery classes, 22 mothercraft classes, and 5 cooking classes.

Along the line of trades and occupations, there are classes in automotive mechanics, cabinetmaking, electricity, machine-shop practice, beauty culture, and advertising and selling. In the business and commercial department there are classes in stenography, business English, arithmetic, penmanship, and spelling.

The handcraft classes offer opportunity for training in all forms of home decoration and the students comprise girls who are employed during the day in offices, stores, or factories. In the sewing classes the membership is made up of girls who must dress well on a small amount of money and who are interested in making clothes for their own use.

The art classes attract students of various types and ages and students are enrolled in both the elementary and advanced art classes.

The classes in machine-shop practice, electricity, cabinetmaking, and automotive mechanics attract a large number of men employed in these trades who wish to advance themselves by special study.

(Continued on Page 58a)

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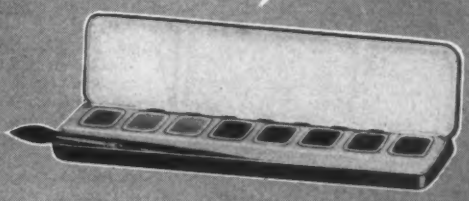

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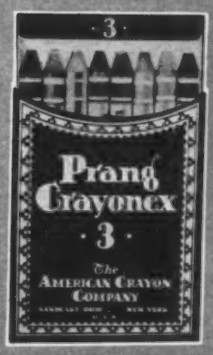

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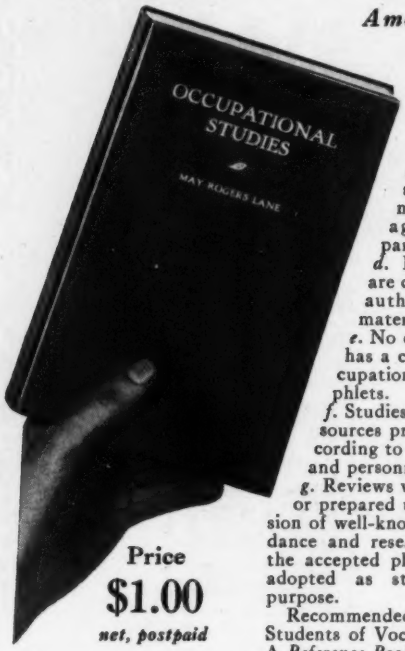

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(Continued from Page 56a)

In Oklahoma City it is found that the evening schools and vocational classes have an especial attraction to the man or woman of average means, who is not poor but who feels the need of an education to progress culturally and in a financial way. The students are drawn from the great middle class which is the support of America and they are an important factor in night-school and trade-education activities.

Evening Homemaking Classes at Kansas City, Kansas. A beginners' unit in homemaking has been formed in two of the clothing classes at Kansas City, Kans. The classes make a selection of patterns and materials and follow this with the construction of undergarments. The millinery classes have been active in the selection and making of hats. One millinery unit has begun the renovating and remodeling of old hats, while the needlecraft unit has made lamp shades, pillows, and plain embroidery. A short unit course in hygiene and first aid for white women is offered once a week.

Fifty Boys Enrolled in Auto Mechanics at Altamont, Kansas. Fifty boys have been enrolled in the two classes in auto mechanics at the Labette county community high school at Altamont, Kan. During the summer months the boys built a new two-story building. The classroom was moved from the old to the new building and the entire building was rewired for light and power.

In the auto-mechanics department, the students are taught not only the mechanical part of the work, but they are also given some training in shop electricity. In one room of the new building, space has been reserved for an automotive-ignition laboratory. The shop is equipped with the latest type of machinery. An average of fifty cars a year are handled by the boys.

Automotive Electricity for Auto Mechanics at Chanute, Kansas. The class in automotive electricity at Chanute, Kans., meets twice each week. There are eighteen men enrolled, who devote one half of the time to lecture and demonstration work and the remainder to work on electrical equipment of automobiles. The class had taken up a study of the fundamentals of electricity and the work has proved most popular with the students.

Trade-Drawing Class Attracts Students from Many Fields. The class in trade drawing at Chanute, Kans., is composed of students from several different fields. There are linotype machinists taking machine drawing, carpenters taking architectural drawing, lumberyard managers taking architectural drawing, and planing-mill men taking architectural drawing. Mr. Jim Gilbreath is the instructor.

Welding Class at Wichita, Kansas. The welding class at Wichita, Kans., is composed of forty men working in two groups. Each group meets two nights a week, under the instruction of W. E. Staklay. These two groups operated for a period of twelve weeks, while a third began work with the opening of the second semester.

Vocational Carpentry at Kansas Vocational School. The vocational carpentry class at the Kansas Vocational School, Topeka, has enrolled ten boys, of whom five are doing first-year work, and five second-year work. The boys recently completed the rough carpentry work on a two-and-one-half story addition to the boys' dormitory. The second-year boys, assisted by the first-year students, completed a large chicken house valued at $350.

Trade Classes at Hutchinson, Kansas. Trade classes in auto mechanics, drawing for carpenters, blue-print reading for masons, steel square for carpenters, chemistry for nurses, and electricity were recently conducted at Hutchinson, Kans., under the direction of Mr. F. T. Fee.

Practical Show-Card Writing at Salina, Kansas. A practical class in show-card writing has been inaugurated at Salina, Kans., under the direction of Mr. F. L. Reynolds. The work covers the fundamentals of lettering and offers instruction and practice in the design of price tickets, posters, and window cards. The members of the class have made practical use of the work.

Kansas Industrial-Arts and Vocational Association Holds Meeting. The Kansas Industrial-Arts and Vocational Association held a meeting at Topeka during the state teachers' meeting, with an attendance of 250 men from all sections of the state. At the meeting, round-table conferences were conducted in woodwork, drawing, sheet metal, printing, wood finishing, electricity, auto mechanics, and machine-shop practice.

The following officers were elected for 1927-28:

President, Mr. F. T. Fee, Hutchinson; vice-president, Mr. J. I. Wolf, Kansas City; secretary-treasurer, Mr. W. W. Scott, Topeka.

Vocational Guidance at Oshkosh, Wisconsin. Vocational assistance for the senior class of the Oshkosh, Wis., High School was provided recently with the aid of Mr. C. M. Sanford, a well-known vocational expert. Mr. Sanford, who spent five days at the high school, urged that students "study yourself and your qualifications; look ahead and decide what vocation will become your lifework."

(Continued on Page 61a)

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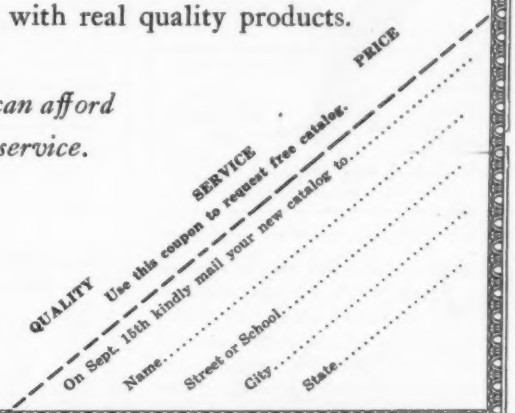

(Continued from Page 58a)

During the five days, Mr. Sanford held general assemblies with the higher classes and general contact interviews with the individual members of the classes with the purpose of assisting the students in choosing their lifework. With the grades of each student in hand, Mr. Sanford discussed with the students their particular inclinations and their choice for a lifework. He outlined and discussed the various fields open for the particular type of work and indicated the best courses in preparation for each type of work. The counselor gave the students his frank opinion and he emphasized that the beginning for every worker is at the bottom of the ladder.

All-Day Trade Classes at Oklahoma City, Oklahoma. For the first time, the vocational department at Oklahoma City, Okla., has this year conducted all-day trade classes at the Central High School. The work offered includes machine-shop practice, auto mechanics, and electricity.

Urges Vocational Education for Pupils Who Leave School Early. Dr. N. W. Cameron of Chester, Pa., in a recent report, gave the results of a survey for the last year, showing the number of children who leave school in the sixth and seventh grades. Dr. Cameron showed that the number of pupils reaching the sixth grade of the city schools is much smaller than the number who start school. Of 1,139 white children, only 711 ever reach the sixth grade; and of 321 colored children, only 123 ever attain the sixth grade. This situation, he believes, makes the continuation-school problem a larger one than is found in nonindustrial communities.

Change Courses for Seventh and Eighth Grades at Belleville, Kans. Supt. W. O. Stark of Belleville, Kans., has announced a change in the courses for the seventh and eighth grades, which gives students of these grades an opportunity to take manual training in place of the artwork formerly a part of the course. The course is being offered at the high school during the last period of the day and is under the direction of Mr. N. G. Sheffer.

Texas Vocational Association Meets. The Texas Vocational Association held its annual meeting on November 25 at Houston, in connection with the meeting of the state teachers' association. Pres. C. L. Davis reported for the executive committee and presented the plans for the association's activities during the coming year.

The annual breakfast which was held on Saturday, November 26, was attended by 150 members. Miss Adelaide Baylor of Washington, D. C., was the guest of honor and the principal speaker. State Supt. S. M. N. Marrs also gave a talk, emphasizing the friendly attitude of the state education department toward vocational work, and offering further encouragement in the promotion of civilian rehabilitation work in the state. The secretary reported 200 state members, which includes membership in the national association.

At the close of the sessions, the following officers were elected:

President, Mr. C. L. Davis; vice-president, Miss Mabel McBaines; secretary-treasurer, Miss Lizzie Barbour.

Manual-Arts Students Construct Model Farm Shop at Taylor, Texas. Students in the manual-arts classes at the Taylor, Tex., High School recently constructed a model farm shop which will be used for the shop activities of the agricultural class. All of the work including the working drawings, the concrete work, the framing, and the finishing was done by the students working under the direction of Mr. W. N. Elam, the instructor.

Manual-Arts Courses for Grammar-School Students. In the Florence Grammar School, Florence, Mass., boys of the sixth, seventh, eighth, and ninth grades receive instruction in manual training for two hours each week. The course offers a working knowledge of woodworking tools, and trains pupils in the acquirement of good habits through the ability to make articles of use and beauty.

The evening classes are intended to afford an opportunity to those employed during the day, to acquire a practical knowledge of tools and construction and to find enjoyment in producing a good piece of work. The courses comprise weaving, drafting, basketry, domestic science and art, and woodworking.

Day classes in sewing and dressmaking are offered to girls of the sixth, seventh, eighth, and ninth grades, for two hours each week for seventeen weeks.

Evening Courses for Printers. The New York Evening High School for Men and Women, New York City, is offering four courses for printers, proofreaders, copy writers, editorial writers, and printing-office workers. The courses are open to men and women and consist of lectures and practical work. The courses are conducted free of charge by Mr. Arnold Levitas and Mr. W. I. Orchard. Certificates of proficiency are awarded at the close of the term to those who have done satisfactory work.

Provide Space for Trade Schools. To provide space for trade schools, the board of education at Cincinnati, Ohio, has leased the four upper floors of a commercial building, which will house the printing-trades school and part of the building-trades school. The estimated enrollment in vocational schools this year is 3,000.

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